JOURNAL

OF

The Philadelphia College of Pharmacy.

NEW SERIES.

VOL. I.—JANUARY 1830.—NO. IV.

Original Communications.

Address delivered by the President, Daniel B. Smith, before the Philadelphia College of Pharmacy, at the Annual Commencement of the College, September 24th, 1829.

It would ill become me, upon the present occasion, and before the present assembly, to attempt by any ambitious effort of rhetoric to captivate or amuse the audience. I cannot forget that we are all plain and practical men of business—assembled here for supporting an institution, the origin and end of which is our own pecuniary advantage. It is true that our profession or business is of a very mixed character—that while on the one hand, we are mere shopkeepers and manufacturers, we are, on the other, compelled to pursue a course of study, and to acquire an extent of information, scarcely less scientific and diversified than those of the physician. There is not indeed any business or trade in the community so nearly allied to the learned profession, and

for a fair reputation in which a greater degree of probity and intelligence is required by public opinion. The merchandise in which we traffic is brought from every region of the globe, and consists of so great a variety of the productions of the animal, the vegetable, and the mineral kingdoms, that to be a skilful druggist is to be not merely a well informed merchant, but a learned naturalist. The daily experience, I will not say of the laboratory, but of the shop and the counter, is a continual application of chemical principles, without a knowledge of which we should be ever groping in the dark. Even where these qualifications are possessed, there must be the still higher attainment of strict integrity and of an earnest devotion to the profession, in order to secure that implicit confidence, on the part of the public, which is the most cheering reward of an honest and skilful apothecary.

If then we are seeking to promote our own private advantage in the establishment of this college, we are seeking to promote it by liberal and patriotic means, the success of which will advance the public welfare in a far greater and more lasting degree than the whole amount of our own individual profit; for the latter will perish with us or our children, and the former I trust will go on increasing with the progress of philosophy and society. The object of this institution is the improvement of the theory and practice of pharmacy, not merely in books and treatises, but on the broadest and most extensive scale at the laboratory and the counter. For this purpose we are providing means for educating our apprentices in all the learning of the age which has a bearing upon their profession, and for imbuing them with habits of the strictest method. The inevitable effect of this system will be, that we, who are now the older members of the college, must apply ourselves again to our studies, must keep pace also with the improvements of science, or we shall see ourselves outstripped in the career by the boys whom we have instructed. Most, and indeed I may say all of the founders of this institution were men who made no pretensions to accurate science or profound learning.

They had been taught the art of the apothecary as practiced in this city—loosely and clumsily, I may now say, without any disparagement to ourselves. They felt the evils of being ignorant of scientific principles and of a deficient pharmacy, and they resolved to apply a remedy. It cannot be supposed that shrewd and enterprising men, such as first embarked in this undertaking, could be blind to the consequences of making their apprentices better apothecaries than themselves. They did perceive them, and met them with a public spirit and a disinterestedness which make me feel proud of my profession.

The benefits which were anticipated from the formation of the College of Pharmacy were of a remote and general kind. It was not then supposed that the reaction of the spirit of improvement could sensibly affect the practice of pharmacy until after a lapse of many years, and to these remote advantages they sacrificed those which many of them possessed as leading druggists, by placing themselves on a level with all who chose to accede to the terms on which the college was established. Their expectations were more than realized, and all who are acquainted with the medical statistics of this city will bear witness to the assertion that the practice of pharmacy has already, since the commencement of our institution, experienced a most salutary and remarkable improvement.

The mark at which we are aiming is however much above the standard of any present attainment. Before we can assume to compete with the kindred institutions of the old world, our system of scientific instruction must be extended to other branches of natural history, and rendered more thorough and minute in those which are already taught; and the candidates for the honours of the college must undergo a close and probing examination before they are admitted to practice under its diploma. Our members must be willing to subject the contents of their shops to periodical scrutiny by impartial and competent judges; the college must exercise a vigilant police over the market for drugs, and over the

weights and measures used in the administration of medicines. We must possess a Pharmacopœia adapted to the condition of this country, and founded upon strict analysis and experiment, in which, without blindly following the formulæ of any foreign college, we may avail ourselves of the lights which are scattered throughout all.

In proportion as we attain these objects shall we realize the great advantages which it is in the power of this college to confer. And it will happen in this, as in all similar cases, that the advantage of it will not be confined to ourselves, but many other classes in society—nay, the whole community will be in a greater or less degree, either directly or indirectly, profited by the improvement and prosperity of our science.

In thus looking to the future with hope, we are naturally led to look back and abroad for instruction, and it may not be an unprofitable task to mark the progress and present practice of pharmacy in foreign countries.

Without exploring the history of ancient nations for the vague and unsatisfactory notices that may be gleaned from their pages, it will be more instructive to mark the first rise of our profession at the restoration of letters in Europe. The business of the apothecary as a separate profession is said first to have existed among the Arabians in the eleventh century. From them the practice spread into Spain and Italy, and following the path of medicine and letters, to Germany, France and England. The language of one of the first European edicts for their establishment, that issued by the emperor Frederick II. for the kingdom of Naples, furnishes a curious example of the change effected by time in the signification of words. This edict provides that the *confectioners* should take oath to keep by them fresh and sufficient drugs, and to make up medicines exactly according to the prescriptions of physicians; it also fixes a price at which the *stationers* may vend the medicines thus prepared. An *apothecary* at that period was simply one who kept an *apotheca* or store or warehouse.

With the discovery of the art of distillation and the introduction of chemical medicines the importance and dignity of the apothecary increased. In many places, and particularly in the opulent cities of Germany, the apothecaries' shops were established at the public expense, and belonged to the magistrates. At the courts of Germany it was very common for the consorts and sisters of the princes to establish and conduct them for the relief of the poor. From these causes in part it has happened that the apothecary has ranked higher in that country than elsewhere. In many places he was a functionary of the government, attached to the court, and receiving a salary. In all he was protected from competition by being one of a number limited by law, and the path to wealth and distinction was thus secured to him. About the close of the fifteenth century, that spirit-stirring era in the annals of our race, the rising importance of the science of medical chemistry appears to have attracted the attention of the petty sovereigns of Europe. It was at this period that Paracelsus introduced the use of mercury, and after filling Europe with his fame, died in the prime of life with a bottle of his celebrated panacea in his pocket! The earliest professorship of chemistry established in Europe was that of Basil, which was first filled by this insolent and intoxicated enthusiast. At Augsburg there were apothecaries' shops so early as the thirteenth and fourteenth centuries. In the middle of the fifteenth century a salary was paid by the city to the persons who followed that occupation, and in the year 1502 a price was set upon all their medicines; all others were forbidden to deal in them; and their shops were ordered to be inspected. These regulations form the basis of the German police of medicine at the present day. The apothecaries are limited in most of the towns to a certain number, so that the ownership of a licensed shop is of great value, and the strictest vigilance is used in the inspection and administration of medicines.

A lively French writer gives the following sketch of the condition of the apothecary at Vienna, which may be taken as a fair specimen of his situation throughout the large cities

of Germany. The number of Pharmaceutists in Vienna is limited, and in their shops the manual labour is distributed, so that one pupil makes all the pills, another all the mixtures, and this alternately for a month or quarter. The prescriptions are copied in a book to which the physician or the patient may at all times refer. The German apothecaries never contend with each other by underselling. They enjoy a consideration founded upon that which they pay to each other; their establishments are a fixed property, and there is neither rivalry nor collusion among them. Secure of realizing a fortune by their business, they introduce a rigorous method into all its details. Less splendid in the exterior of their shops than the French; they have more true solidity in the arrangements within, and their medicines are recommended by the excellence of their preparation. The German apothecaries have prevented their business from becoming purely mercantile. They have commanded respect from others by paying it themselves to their profession. In the midst of wars and disorders the German apothecaries have profited by the discoveries and improvements of other nations, and have remodeled their dispensatories upon the most scientific principles. More copious than the English, and less prolix and complicated than the French, their pharmacy has adopted the best parts of the Pharmacopœias of London and Paris, and is intermediate between these two systems. The Germans accordingly furnish apothecaries to many of the neighbouring countries. They enjoy the monopoly of the business in Prussia, and there are none but German apothecaries in Moscow and St Petersburg.

In the latter city an apothecary dare not make up a prescription of any practitioner whose name is not in the printed lists of physicians; nor can he venture to sell a drug, however small in quantity or insignificant in quality, without a prescription regularly signed; and every thing sent from his shop must be wrapped in a sealed packet.

The practice of pharmacy in England has remained unfettered by any other legal restraints than those which restrict

other branches of industry in that kingdom. The physician originally prepared and furnished the medicines for his own patients, but by degrees those who prepared the medicines became a separate class of men. The apothecary in England was at that time precisely what he is in America at this day—a retailer and compounder of drugs. The temptation to prescribe for his customers appears to have been too strong to be resisted, and the apothecary lapsed by degrees into the practising physician. The regularly educated resisted this innovation as long as it was in their power, and the controversy on the subject was both virulent and ludicrous. The apothecary however triumphed, although he rendered homage to the physician as his superior. He became the ordinary practitioner in families, charging not for his advice but for his attendance and medicines, and yielding his post to the physician in cases of emergency. The alliance is more profitable to the craft than to the patient, for it has given rise to such an immoderate use of medicines among the English as has become proverbial, and justifies in degree the sarcasm of a French writer, who says that they carry their idolatry to medicines to such a pitch that they bear about them wherever they go their favourite salts and digestives.

In London, and all the cities and towns of Great Britain, apothecaries, or as they there style themselves, druggists, are now to be found who confine themselves to selling medicines, and who do not prescribe. Within the last forty years this class of tradesmen has greatly increased, and the principal shops of the kind in London are perhaps among the best regulated in the world. In one especially—the most celebrated in that great emporium—the system of business is so perfect as to excite admiration. The shop is situated in a narrow court, the only access to which is through an arched alley. Before any article is allowed to be sold it is examined and approved, and if a chemical preparation, is tested by one of the partners, and no medicine is permitted to pass out of the shop but of the finest quality. Each clerk has his particular station at the counter, and the requisites of business

about him, his own money drawer and medicine bottles, scales, measures and papers, for the utmost cleanliness of all which he is accountable. He sets down all the money he receives, as it is paid in, and keeps his own cash account. No conversation above a whisper is allowed except on business.

A minute account is kept, and an investigation made at regular periods by one of the proprietors, into all the incidents of the shop, the errors in putting up medicines, or in the cash accounts, and of the manner in which the rules of the shop, which embrace all the minutiæ of cleanliness and method, have been observed. Such strict system and accuracy may be difficult to enforce, and may seem like an useless waste of time. But there is no such thing as too much system or accuracy in the business of an apothecary; and the great reputation of the shop to which I allude is a proof that it is profitable as well as creditable. A thousand guineas, it is said, have been offered to the proprietors as a fee for an apprentice.

The history of pharmacy in France however presents more materials for our instruction than in any other country of Europe. The trade of the apothecary had its origin in that kingdom in the thirteenth or fourteenth century, and the apothecaries were for a long time the menials of the physician. The oath which the latter imposed upon the former before they were allowed to open shop is a curious example of the mental slavery of the times. The apothecary bound himself by the most solemn sanctions of that superstitious age, to give no medicine whatever without the counsel of some learned doctor, to do nothing rashly without *advice*, never to speak disrespectfully of the ancient doctors, but to honour and render service to them, and to do every thing for the honour, glory, and majesty of medicine. Another part of his oath is as little to the credit of his morals as that which I have quoted is to his independence. He bound himself not to administer poison even to his greatest enemies, and never to substitute one medicine for another without the advice of a person wiser than himself.

In a country where such an oath could have been exacted, and men were found servile enough to take it, we cannot wonder at the contempt into which both the physician and the apothecary sunk, and with which even the overwhelming satire of Moliere could not have covered them, had there not been as much truth as wit in his exquisite caricatures.

The profession of the apothecary has however long since recovered its respectability in France, and has been elevated and protected by a code of laws which deserves in most respects to be universally copied.

Many wholesome regulations were enacted under the Bourbons about the middle of the last century; but the laws which created and now govern the schools of pharmacy were the offspring of the revolution. The number of physicians who were members of the national assembly will account perhaps for the great attention which was paid by that body to the interests of the healing art; but it is nevertheless one of the extraordinary features of that period of violence and bloodshed, that neither its foreign nor civil wars, desperate and ferocious as they were, interrupted to any extent the progress of science and the arts.

The French law regulating the sale and dispensation of medicines establishes three schools of pharmacy—one at Paris, another at Strasburg, and a third at Montpelier. Each of these schools is obliged to open at least four courses of experimental lectures—one on botany, one on the natural history of medicines, and the other two on practical pharmacy and chemistry.

The pharmaceutists in those cities are compelled to enter at the school the name, age and other circumstances of their apprentices, who are all obliged to attend the lectures. An apprenticeship of eight years is required before a person is allowed to open a shop, except he has attended three courses of lectures in one of the schools, when only an apprenticeship of six years is exacted. We may suppose that the course of instruction in these schools is both learned and extensive from the length of time it occupies, which

is five months, and from the strict scrutiny which is exercised over the attendance of the pupils. A roll of their attendance is kept, and the professor at the end of the course delivers to each one who has attended a certificate thereof. An absence without a legitimate excuse from six lectures will deprive a pupil of this reward. A prize is annually delivered at the expiration of the course for the best essay on any of the sciences taught in the schools.

When a pupil wishes to become a licentiate, he is required to produce the certificates of the school where he has studied and of the pharmaceutists with whom he has served his time, as well as an attestation of his moral conduct, signed by two resident citizens and two authorised pharmaceutists. He must also produce a certified copy of the register of his birth, to prove that he has completed his twenty-fifth year. If the director and professors of the school are satisfied with these documents, they appoint a day for the first examination. The student must undergo three public examinations, the interval between each of which must be at least a month. One of these is on the principles of the art; another on botany and the natural history of the materia medica; the third examination is on the practice of pharmacy, and continues for four days. It consists of at least nine chemical or pharmaceutical processes, performed by the candidate in the presence of the examiners, to whom he must describe the materials, the operation and the results, and explain the rationale of the process. He must receive the votes of two-thirds of his examiners before obtaining his diploma.

In those places where there is no school of pharmacy established, the examinations are conducted in the same manner by a jury composed of physicians and pharmaceutists, and no person is allowed to practice pharmacy unless licensed by a jury, or by one of the established schools. The licentiates of the schools can exercise their profession in all parts of the kingdom; those of the juries are restricted to the department in which they have been examined. No phar-

maceutist is permitted to sell any secret medicine. At Paris, Strasburg and Montpelier an annual inspection of the shops and warehouses of the pharmaceutists and druggists is performed by a board consisting of two professors in the medical school, the members of the school of pharmacy and a commissary of the police. All deteriorated or badly prepared drugs are seized by the commissary, and the person in whose shop they are found is liable to a fine of one hundred livres and an imprisonment not exceeding six months. These annual visits of inspection are paid in other places by the juries who examine the candidates. The laws regulating the sale of poisons are exceedingly severe, and the list of forbidden medicines extends considerably beyond the usual limits of caution in this country. It includes not only arsenic, corrosive sublimate, and lunar caustic, but the mineral acids, several preparations of zinc, antimony and copper, and caustic potash. All these substances are required to be kept in secure and separate apartments, of which the master of the shop alone keeps the key. They are to be sold to none but a known and resident person, under a penalty of three thousand francs; and all purchasers must write their names and residence, the quantity and nature of the poisonous drugs they have bought, and the purposes for which they are wanted, in a register open to the inspection of the police, under the same penalty.

There is another branch of the public law of France on this subject which deserves our particular attention, for it strikes at the root of a practice of great extent and great mischief in our own country; I allude to the encouragement given by our druggists to ignorant, idle, and drunken collectors of herbs and roots. No person is allowed to follow the business of an herborist, as it is there called, without undergoing an examination into his competency before the same bodies which examine the pharmaceutists. This examination extends to his knowledge of medicinal plants and of the precautions necessary to their collection and preservation. A certificate of examination is furnished to the successful

candidate, and he is subjected to the annual visits of inspectors in the same manner as the pharmaceutists.

Notwithstanding the wisdom of many of these regulations, it appears that in the enforcement of the law many abuses have crept in. The professors in the schools of pharmacy, in order to augment their fees, have been very lax in their examinations, and the juries have been still more careless of the qualifications of candidates. The consequence has been that the country is overrun with ignorant and unqualified licentiates, who blend other branches of industry with the sale of medicines.

These abuses attracted the attention of the society of pharmaceutists of Paris, which addressed a memorial in the year 1817 to the chamber of deputies on this subject. In this memoir they speak with becoming pride of the high character of their profession. "The knowledge" say they "which pharmacy requires, without being as extensive, is in part the same as that which is necessary to the physician. It is as various, and is sufficiently useful to entitle him who possesses it to the particular protection of government and to general respect. The pharmaceutists enrol in their number men of distinguished learning, who belong to the most celebrated academies, skilful professors who fill the chairs of chemistry and natural history, writers whose works are sought for in France and abroad, respectable citizens whose public services have been rewarded by honours, titles and decorations." It is only to enumerate the names of Parmentier, Vauquelin, Deyeux, Henri, Planche, Pelletier, Virey, Boullay and Robiquet, to vindicate the warmth of this honest eulogium.

In speaking of the abuses which had crept in through the causes to which I have alluded, they observe that "the number of established pharmaceutists soon exceeded every where the wants of the inhabitants. This disproportion between the shops and the population was equally fatal to pharmacy and the public. When the confidence of physicians and patients is divided between too great a number

of shops, does it not offer temptations to the least successful, which are at the least of great inconvenience to those who trust for their cure to the faithful execution of the prescriptions of the physician? Whatever may be the probity of a pharmaceutist, his pecuniary means, his credit and his sales always influence the proper choice, preservation and renewal of the medicines he employs. This profession bears no resemblance to those in which the prosperity of the trader is useful only to himself. The prosperity of the pharmaceutist is a guarantee to the public almost equal to that which is afforded by his learning. This guarantee disappears if the multiplicity of shops places a part of them in a precarious situation.

"The medical juries" say they "have peopled the country and the small towns with apothecaries destitute of all the requisite learning and science, whose knowledge of their business was limited to a few manual operations.

"The want of discipline and inspection opens the door to many other abuses. Perfumers, confectioners and distillers undertake to sell medicines; and to crown these disorders a cloud of charlatans, without title, without learning, and without shame, have established themselves in the towns and villages, cover the walls with their bills, and distribute them on the bridges, the wharves and public walls. These men are neither physicians, surgeons nor pharmaceutists; yet they practice physic, surgery and pharmacy; they inundate the country with their nostrums; and the public journals, which are hired for the purpose, daily make a boast of these pretended specifics."

Who does not recognise in this sketch of the condition of pharmacy in France many of the evils which mark in a far higher degree its state in our own country—the want of scientific skill and of competent qualifications—and the evils of unrestricted competition.

The pharmaceutic code of Prussia has provided against the abuses of which the French pharmaceutists complain, by requiring and carrying into effect a far more rigorous exami-

nation of the candidates. The laws of that kingdom require that a candidate for examination must have served a regular apprenticeship of five years, or have been employed for three full years as an assistant in a licensed shop, and at the completion of either period must have attended two full courses of lectures on botany, chemistry, natural history, pharmacy and medical jurisprudence. The board of examiners is composed of two chemists and naturalists and two scientific and practical apothecaries, who are paid by the government, and have had no part in the instruction of the pupil. The candidate is first obliged to translate passages taken at random from the Prussian Pharmacopæia, to satisfy the board of his skill in the Latin language. He must then write a Latin theme on two subjects of chemistry or medical jurisprudence, the titles of which are drawn by lot from an urn. This theme must be written in eight hours, in the presence of the examiners, without the aid of books, assistants or extracts. If he pass this ordeal, two difficult subjects of pharmaceutic or analytic chemistry are given to him, upon which he is obliged to write a theme at his own dwelling, with the aid of books, in order to prove that he has received the highest scientific chemical education. He then draws by lot two chemical or pharmaceutic substances, either natural or artificial, and is allowed eight days, at the end of which time he must have made a complete analysis of them, and written down the results of his experiments. He is also obliged to analyse the contents of the purposely poisoned stomach of an animal, and to write a juridico chemical paper thereon. Not satisfied with so close a scrutiny, which would deter any apothecary in this country from soliciting an examination, the candidate is then required to draw by lot the names of two pharmaceutic compounds of difficult preparation, which he is obliged to prepare in the presence of the committee extemporaneously.

Specimens, fresh and dry, of officinal plants, ten samples of drugs, and several chemical preparations are then placed

before him, which he must name at sight. He must then give accurate scientific descriptions of the plants and of their uses, must describe the origin, properties, and adulteration of the drugs, and the chemical elements, mode of preparation, and usual adulterations of the chemicals, and the means of testing their purity.

The examiners are obliged to be present through all these trials, and to keep accurate minutes of their proceedings, and of the success or failure of each attempt. If they approve of the candidate by a majority of votes he is admitted to the public examination, at which he must answer questions in chemistry, natural history and medical jurisprudence; after which, if he is still further approved of, he is recommended to the minister of the interior, who gives him a license to practice his art.

From this brief and imperfect sketch of the laws regulating the practice of pharmacy abroad, let us turn to the condition of the art in our own country. How great is the contrast! An entire absence of legislative enactments, and with the solitary exception of this city, an almost entire want of professional emulation and of scientific instruction. This state of things has arisen from the freedom of our institutions, which places no restraint whatever upon private enterprise, and from the recent settlement of the country, which still checks that subdivision of labour that is perhaps necessary to the highest degree of excellence in the arts and sciences. It is but a few years comparatively since the business of the apothecary was separated from that of the wholesale druggist and the dealer in paints and dye stuffs. Not thirty years ago almost the only apothecary's shop in Philadelphia, where the physician was sure of obtaining the latest foreign preparations, of having his medicines and prescriptions prepared under the eye of the master, and with competent pharmaceutic skill, or in which a strict system of accountability was carried through the details of the shop, was that of the late Charles Marshall. The cause of his success in business was his strict integrity, his scrupulous accuracy,

and his patient attention. As the first president of this college he is entitled to our respect and remembrance. He was one of its warm supporters, and though too far advanced in years to take an active part in its proceedings, the interest which he felt in its welfare continued to the close of his long and useful life.

It is now about ten years since an accidental circumstance first impressed the apothecaries and druggists of Philadelphia with the necessity of exercising some supervision over the sale of medicines. A case of opium was purchased in New York by one of our principal dealers, which was said to be Persian opium, and which was soon discovered to be a fraudulent preparation. A meeting of the trade was held and a committee appointed to investigate the history and nature of the opium, which they did, and published their report in the daily papers. The fraudulent drug was immediately withdrawn from the market, and no similar attempt at imposition has since come to the knowledge of the public. From that time the necessity of forming an association of druggists became a favourite subject of discussion with many in the trade. In the year 1821 the trustees of the University of Pennsylvania, at the suggestion principally of the professor of materia medica, made provision for conferring the degree of Master of Pharmacy on those apothecaries who should be deemed most competent to the business, and for the establishment of lectures on pharmacy, the examination of candidates, and the admission of them to practice under the sanction of the medical school of the university. This arrangement was defective in many respects; it would have created a controul over the business of the apothecary without any equivalent compensation, such as our college has rendered. The druggists therefore resolved to take into their own hands that supervision and improvement of their trade which was acknowledged on all hands to be expedient. A meeting was held on the 13th of February 1821, at which the principal druggists attended, when it was resolved to form a college of apothecaries for the pur-

poses of regularly instructing apprentices in the scientific parts of the business and of checking the prevalent abuses. The college was incorporated in the year 1822, by the title of the Philadelphia College of Pharmacy, and its career from that day to the present has been one of steady and active exertion for the improvement of our business. The extent of these exertions and of the advantages which have flowed from them are not now appreciated, for they consist in great measure in clearing the ground and laying the foundation for future labours. The first efforts of the college were directed to the formation of a school of Pharmacy. The regulations which it has adopted in relation to this, are perhaps all that the present state of our business will admit. The members are restricted from taking apprentices for a shorter period than four years, and each apprentice is required to attend two full courses of lectures, one on materia medica and pharmacy, and the other on chemistry. At the expiration of his apprenticeship he may, provided these conditions have been fulfilled, become a candidate for the diploma of the college, and must submit to an examination before a committee, consisting of the professors and three members appointed by the college. Our diploma is of course but an honorary distinction, that confers no privileges or advantages beyond those which public opinion accords to the well instructed and intelligent. It bestows no title, for it was the design of the college to avoid any name which may hereafter acquire a peculiar meaning, and become the designation of a new class analagous to the English apothecary. In attempting to avoid this danger, it has committed what may perhaps be esteemed a blunder, by establishing a distinction without giving to it a specific name, and simply declaring that the successful candidate is a graduate in the college. Those who have already passed their examination may be disposed to smile at the contrast between the trial to which they have been subjected and the severe ordeal of the Prussian code. It is true that we require as yet no proof of skill in analytic chemistry, but the questions of the ex-

aminers extend to all the branches of chemistry, pharmacy and natural history which are taught in the lectures, as well as to the more practical details of the business of an apothecary. To answer these questions with the promptness and accuracy that have in most cases been done, implies an acquaintance with the theory and practice of our art highly creditable to the candidates, and when contrasted with the state of things but a few years past, full of promise for the future. A taste for chemical pursuits has been awakened in our apprentices, who have formed themselves into a chemical society, which meets in this hall under the auspices, we may say, of the college. We already perceive the beneficial effects of thus arousing their ambition in their increased attention to our interests and their love of the business, and I speak from experience when I say that the direct and immediate influence of the school of pharmacy has been to enhance to the master the value of his apprentices. This happy result is no doubt owing in great measure to the personal character and influence of the professors whom it has been the good fortune of the college to secure.

I would not willingly offend against the decorum of modesty in speaking of those who are now present, but it must be acknowledged that if the college has been enabled thus to persevere in its work of reformation through good and evil report, and amidst discouragements of various kinds, it has owed much of the strength which it has shown to the zeal, to the learning and the perseverance—to the attractive, yet solid and practical lectures, and to the many amiable and excellent qualities of Drs Wood, Jackson and Ellis.

When the improvements which are now contemplated shall be made, and a hall, fitted up with every convenience, not merely for lecturing, but for teaching practical analytic chemistry, shall be built, we shall then increase our library and cabinet, and widen and deepen our course of instruction; and we may then hope by degrees to render the title of a Philadelphia apothecary but another name for a profound chemist and naturalist, and thus place our business where it ought to be, in the rank of the liberal professions.

Another department of the institution is the inspection which it professes to bestow upon the market for drugs and chemical preparations. Its influence in this respect has hitherto been of an indirect nature, although even as such it has been very considerable, for the general emulation which the establishment of the college has excited, has produced a scrutiny in the choice of medicines, and a care in their proper preservation, which already influence the market. It is by no means so easy as it was formerly to sell an inferior or sophisticated article; and higher prices are paid for medicines than could be obtained before the college was founded. A single instance will show the force of this observation. Twenty years ago almost the only kind of cinchona that was retailed in this city was the inferior variety brought from the Spanish main, and known by the name of Carthagena bark, which was only worth from ten to twenty-five cents per pound, and would have been burned by the public officers had it been sent to Europe. At the present time no respectable apothecary would offer bark of such a quality to his customers. Similar remarks will apply to many other drugs, and to almost the whole catalogue of chemicals. It is only recently that it has been esteemed essential to procure the mineral acids, ammonia, alcohol, and the ethers, of standard specific gravities, of strict purity, or to prepare the officinal formulæ by the officinal weights and measures. A spirit of accurate examination into the qualities of medicines, of honourable emulation to excel in the whole arrangement and ordering of our shops, has taken place of this sordid indifference, and is co-operating with the influence of the college to produce an entire change in the practice of pharmacy in this city. The greatest discovery which has ever been made in pharmaceutic chemistry—that of the new vegetable alkalies—and of the facility which the active principles of our most valuable medicines can thus be insulated, has been made at a period singularly happy in regard to its influence upon this spirit of improvement, for it has thrown open to the active and

awakening curiosity of our pupils a new field of investigation, in which the harvest of discovery that awaits the chemist will probably be more rich and copious than in any other department of chemistry.

It is now the third year since the system organised for granting our diploma has been carried into effect, and during each of those years there have been successful candidates for its honours. The trustees of the college have announced, in the regular course or their duty, that at the close of the last session of the school of pharmacy Charles Pleasants, William R. Fisher, Joseph Head Brook, Joseph Scattergood, John Allen, Franklin R. Smith and Robeson Moore, having completed the regular term of apprenticeship, and attended the requisite courses of lectures; having also each of them produced a written theme on some subjects of pharmacy or chemistry, and been questioned by the examining committee upon their attainments and qualifications, have been declared worthy of receiving the diploma of the college.

It is now my pleasing duty, in conformity with the directions of the college, to deliver to you this testimonial of your industry and acquirements. You will receive it, young men, I trust, in the spirit with which it is granted; not merely as a tribute of praise to that industry and docility which become the period of youth, but as an earnest of your future acquirements, and of the distinction which it may be in your power, by your learning and good conduct, to confer back upon the institution which thus honours you. You are entering upon the stage of life with peculiar advantages, which may influence the whole course and destiny of it, if you improve them as they deserve. The business to which you have devoted yourselves, is one that blends the humble offices of a shopkeeper, with the studies and researches of the scholar, so as to elevate and ennoble the one and to give a practical and useful character to the learning of the other. It is a business in which the strictest method, attention, patience and economy are indispensable for success; for it is a business the beginnings of which are small, the in-

creases thereof slow, although the end be safe and certain. You must always bear in mind that your reputation will be your capital in trade, and that it is reputation not merely of professional eminence, but in the highest and most comprehensive sense of the word, as a skilful apothecary—as a careful, prudent and steady citizen—as an honest, humane and upright man—which constitues this capital, and which it should be the chief study of your professional life to deserve. In the ordering of your shops you should practice the strictest accuracy and method. It is impossible for you to err in the extreme on this point, for the lives of your fellow citizens are in your hands. The reputation of the medical profession is dependent in most cases upon our fidelity in preparing their prescriptions—and a single error of carelessness or ignorance may deprive you at one blow of the rewards and the promises of all your past labours, and be the means of plunging a family into the greatest distress, and an unprepared fellow creature into eternity. The responsibilities of our profession are indeed serious, and the saying of the illustrious Cullen is not less true of the apothecary than the physician—that it is his first duty to fear God.

The uncertain course of human events will probably bear some of you to distant lands, and scatter you widely from each other and from your preceptors. Wherever and under whatever circumstances you exercise your profession, endeavour to bear in mind the circumstances of this evening. Consider them as a pledge rendered to your instructors, to the college of pharmacy, and to your fellow citizens, for your future honourable conduct, your professional integrity, and the lustre which it is in the power of every one of you by patient scientific research and investigation to shed upon that institution for which, wherever your lot may be cast, I trust you will always entertain feelings of lively gratitude and affection.

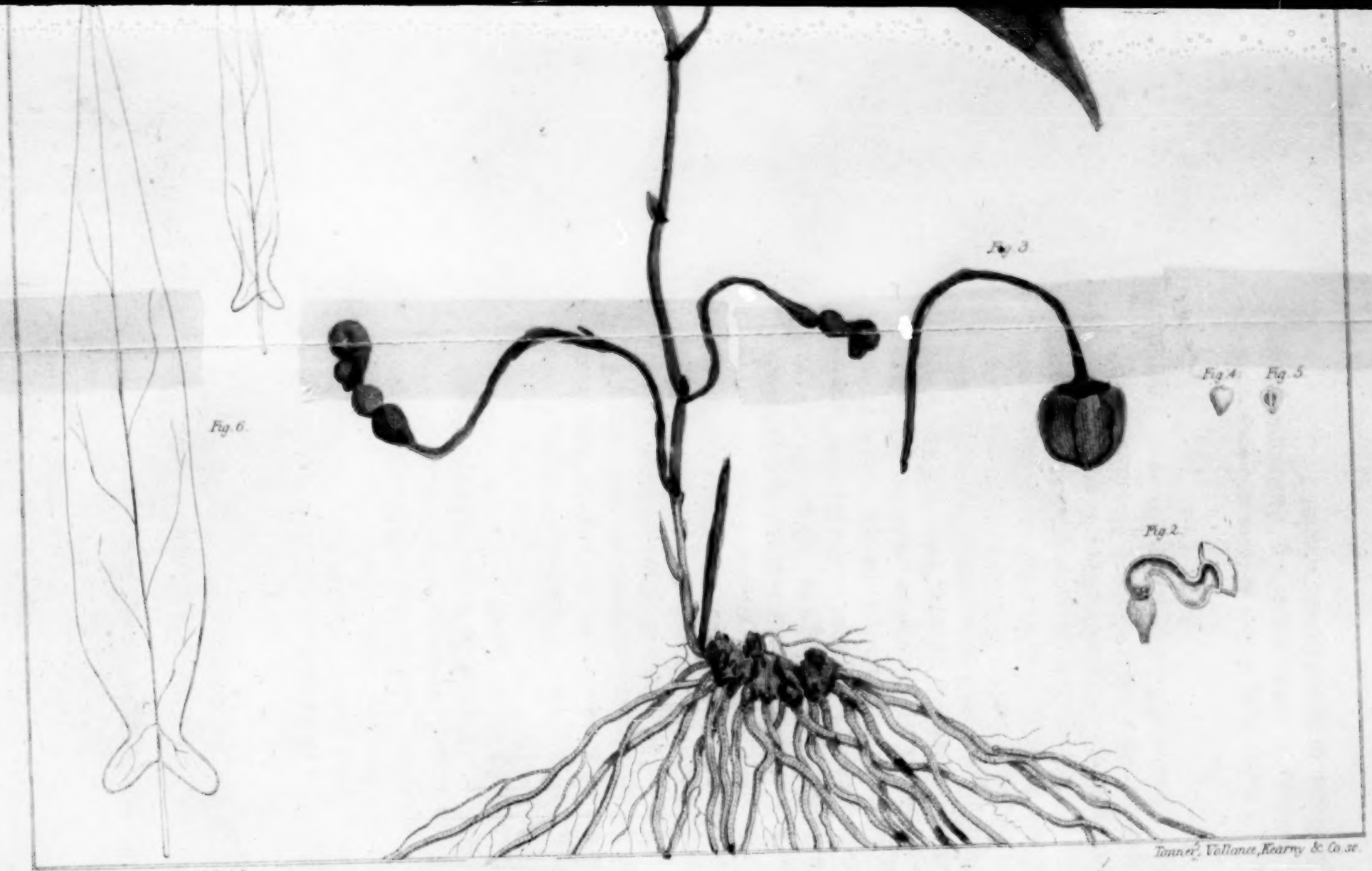
On the Virginia Snake Root, and the genus Aristolochia. *By Daniel B. Smith.*

The publication committee having obtained from the proprietors the use of a set of very faithful and spirited engravings, executed from drawings by Dr W. P. C. Barton for his Medical Flora of the United States, design to publish an engraving in every future number of the Journal, and to accompany it with an original memoir. In these memoirs little further will be attempted than to compile, from the most authentic sources, a full, yet concise history of the plant, and it is thought that by bringing into one view the botanical and chemical characters, and the pharmaceutic history of our indigenous vegetables, the practical usefulness of this Journal may be much increased. The subject which has been selected as a specimen of the engravings, and of the manner in which it is proposed to compile the memoirs, is one of the most valuable and well established of our native remedies. The wide range of country over which it is to be found will render the engraving particularly useful, as it will enable the apothecary to detect this well characterised species in almost every forest of the middle, western, and southern states.

Aristolochia Serpentaria. L. sp. pl. 1363.
Pursh. Fl. Am. Sep. II. 596. Barton Med. Flor. II. 41, Nuttal. Gen. Am. Pl. II. 199. Torrey Comp. 323. Loudon Encyclo. Pl. 13022.

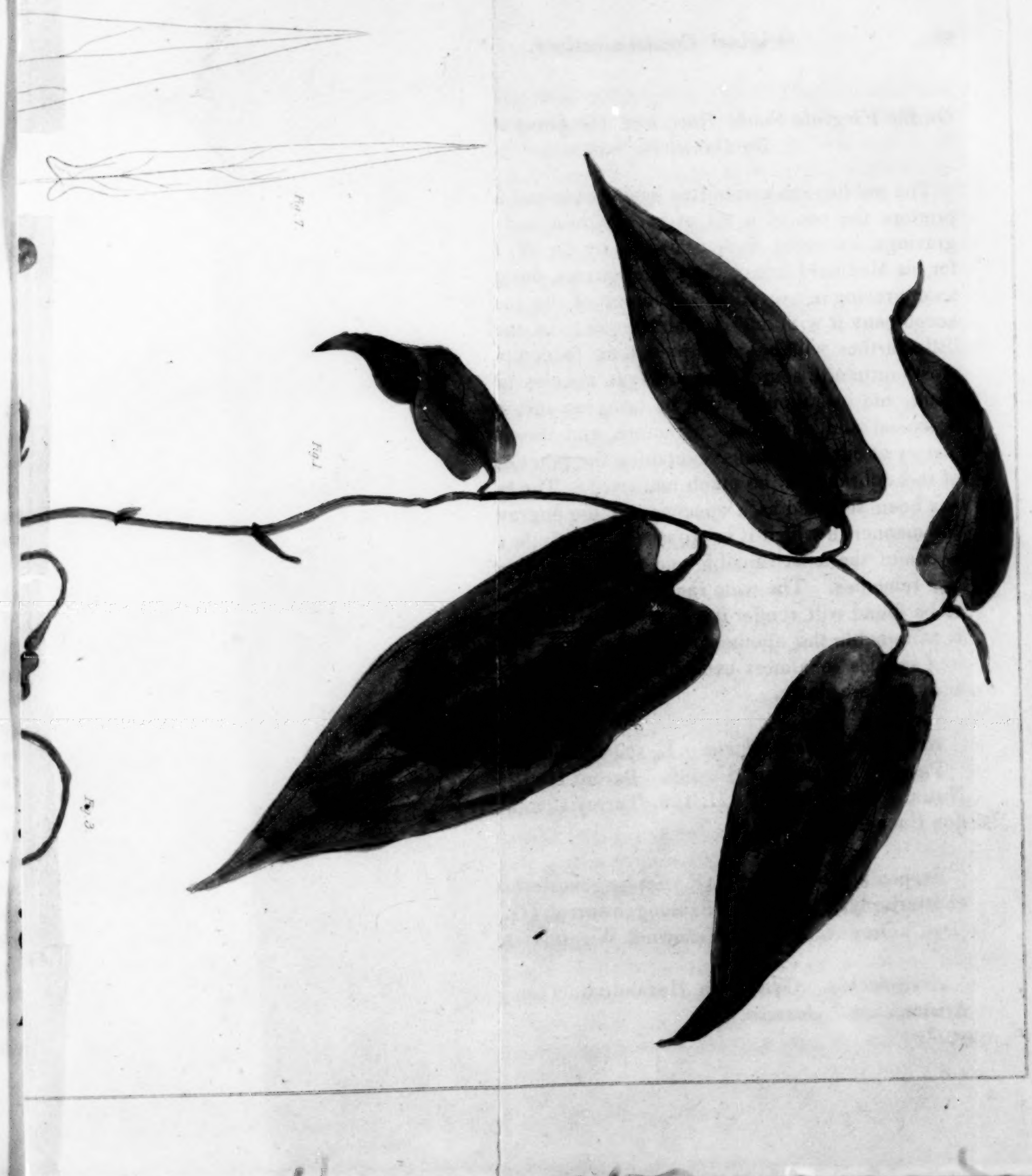
Serpentaire de Virginie, (F.) Schlangenosterluzey, Virginienosterluzey, Virginische Schlangenwurzel, (G.) Slangrod, (Dan.) Ormrot, (Swed.) Wezownik Wirginianski, (Pol.)

Aristolochia. Gynandria Hexandria. (Lin.) nat. order. Aristolochiæ. *Jusseiu.*



ARISTOLOCHIA SERPENTARIA.

(Virginian Snake-root.)



Calix, none. *Corolla* one petalled, ligulated, with a ventricose base. *Capsule* six celled, many seeded, inferior. *Nuttal.*

A. Serpentaria. "Leaves alternate, petioled, cordate-lanceolate, acuminate, *three nerved.* Peduncle subradical, one flowered, with ovate bractes. Cal. none. Cor. purplish, tubulous, limb three cleft. Seed many. Root fibrous aromatic. Capsule six angled, fuscous, six celled, divided to the base by six valves. Flowers in June; ripens in August. —*Muhlenberg's MSS. Flor. Lancast.*

A. Serpentaria. "The root is extremely fibrous, and sends up a number of stems, simple, or slightly branched, less than a foot in height, jointed, flexuous, and often of a reddish tinge. Leaves alternate, on short petioles, oblong, entire, acuminate, heart-shaped at base, and three nerved. The flowers grow close to the ground; they have a stiff, leathery texture, and a dull brownish purple colour.

"The peduncle has one or more leaflets, and gradually enlarges into a furrowed obovate germ. The corolla consists of a long, contorted tube, bent in the form of the letter S, swelling at its two extremities, having its throat surrounded by an elevated edge or brim, and its border expanded into a broad, irregular margin, forming an upper and an under lip, which are closed in a triangular manner in the bud. Anthers twelve, growing in pairs to the sides of the fleshy style, which is situated at the bottom of the corolla, and covered by a firm, spreading, convoluted stigma, which extends over the anthers. Capsule obovate, six angled, six celled, with numerous flat, small seeds. Woods near New-Haven. June. Perennial."—*Bigelow's Plants of Boston, 2d edition*, 1824.

Pursh says, "I have seen a very narrow and long leaved variety of it, which, if there were any difference in the flowers, might claim to be a distinct species."

The Virginia snake root which is found in commerce appears to be gathered indifferently from the A. Serpentaria, the A. Tomentosa, (A. Hirsuta, *Muhl.*) the A. Hastata, the A. Sagittata, (*Muhl.*) and perhaps some other species, if, as is asserted by Rafinesque, (Med. Flor.) there are several species having similar leaves, but differing in their inflorescence, which are all called A. Serpentaria. It may reasonably be doubted, whether the love of minute distinctions has not led this zealous naturalist into an error; and whether even some of the species above enumerated are not mere varieties that pass insensibly into each other, and belong to the officinal species. Barton says, that "on an examination of the species in the Muhlenbergian Herbarium, the *serpentaria, hirsuta* and *sagittata* appeared very closely allied; and on tasting and smelling the roots, I could perceive no difference in their sensible properties." Med. Flor. II. 45. In examining several parcels of the dried snake root in the shops, I was able to distinguish three distinctly characterised forms of the leaves. One of these was that of the true serpentaria, which is marked, as may be seen in the plate, by the margins of the leaf running parallel for about half the length. In another parcel, which was collected in the southern states, there was a considerable mixture of leaves precisely agreeing with the figures 6 and 7 of the plate, which are the sagittata of Muhlenberg and the hastata of Nuttal. In several other parcels, all of which were collected in the western states, I found many leaves approaching to the form of those of the hirsuta or tomentosa. They are distinctly marked as roundish cordate, with none of the parallelism which characterises the true serpentaria. In another parcel from the state of Tennessee, the hirsute leaves and stalks left no doubt as to their being the true tomentosa of Nuttal. There was no perceptible difference in the taste or smell of the roots in these parcels, but I thought I could distinguish that those of the A. Hirsuta were smaller and more branched and fibrous. Dr Anthony Todd Thompson asserts, in his London Dispensatory, that the serpentaria

brought to London is mixed with the roots of the collinsonia pracox of Walter, (the scabra of Pursh, and closely allied to, if not identical with, the scabriuscula of European botanists). This plant is a native of Florida and the southern states. I am not acquainted with the form of the root; but the quadrangular stem, the ovate opposite leaves, and the whole habit of the plant, which is one of the Labiatæ of Jusseiu, are sufficient to distinguish it where the leaves are mixed with the roots, which is often the case.

I am ignorant of Dr Thompson's authority for this assertion; but as almost all the snake root brought to our market is the growth of Ohio, Kentucky, Indiana, Virginia, and western Pennsylvania, where the C. Scabra is not found, I have not met with this adulteration in Philadelphia.

It is asserted in the Dictionaire des Drogues, article Serpentaire de Virginie, that the snake root is sometimes adulterated with the roots of the Asarum Virginicum. I suspect that the only authority for this assertion is to be found in the little tract of Schoepf, entitled "Materia Medica Americana, potissimum regni vegetabilis," published in 1787. In this work he says, "Asarum virginicum *olim* pro serpentar. virginica in anglia vendebatur." P. 73. Whatever may have been the case previous to the year 1786, this sophistication is certainly now no longer practised. The roots are easily to be distinguished by their black colour, and their different mode of growth. The asarum is however closely allied to aristolochia in its botanical and medicinal properties, and belongs to the same natural family of plants.

In a parcel of snake root from the state of Tennessee which is now before me, there is a large mixture of the roots and stalks of a very different plant. These were easily recognised by their quadrangular stem, (becoming roundish near the root), by their opposite, brachiate, sessile, lanceolate, ovate, entire leaves, by the long linear segments of the persistent calyx, by the mode of inflorescence, and finally by the sweetish, subacrid and nauseous taste of the roots, to be

the *Spigelia Marilandica.* This is an important fact, and should render our druggists exceedingly careful in the purchase of their snake root, particularly when brought from those districts in our southern states, where the serpentaria and the spigelia grow together in great abundance. When the stems are mixed with the roots, it is easy to detect the sophistication by the eye; but it will require a closer examination to distinguish the roots by themselves. Their appearance is very similar, and it is only by the taste that we can assure ourselves of the genuineness of the snake root.

The chief part of the snake root sold here comes from Wheelan and Pittsburg, and is the growth of the valley of the Ohio. It grows on the hill sides and bottoms in great profusion, along with the quinque panax folium, the roots of which are often intermixed with it. Like the spigelia and the polygala, it is often very imperfectly cleaned from the leaves and dirt, so that it is rarely that we meet with a bale that is in a proper state for the use of the apothecary.

The A. serpentaria is a native of the whole middle and southern sections of the United States; it flowers in May and June, and ripens its seed in September. The root is perennial, consisting of numerous small fibres of a brownish yellow colour, attached to a short, contorted, knotty, horizontal caudex. These fibres become brown by drying. From these roots rise several stems about eight or ten inches in height; slender, round, flexuose and jointed; supporting at each joint an oblong, cordate, acuminate, entire leaf of a pale yellowish green colour. The flowers proceed from the joints near the root, and stand upon long, slender, jointed peduncles, which are sometimes furnished with small scales, and are curved, so as nearly to bury the flower in the earth and decayed leaves.

There is no calyx; the flower is solitary, monopetalous, tubular, contracted and curved in the middle; of a brownish purple colour, and terminating in an irregular lip. The six

anthers* are sessile, attached to the stigma, which is roundish, divided into six parts, almost sessile, rising from an oblong, angular, hairy, inferior germen. The capsule is hexangular, six celled, and contains several minute flat seeds.

The ordinary price of snake root is from fourteen to sixteen cents per pound, and it is brought to market in bales, containing from two to five hundred weight.

Virginia snake root has a strong odour, somewhat like camphor, and a bitter pungent camphorated taste. Bucholz, a German chemist, analyzed this drug and obtained

Volatile oil	.05
Yellowish green resin	2.85
Extractive	1.7
Gummy extract	18.1
Woody fibre	62.4
Water	14.55

The analysis of M. Chevallier gave the following results —volatile oil, a yellow bitter principle, soluble in water and alcohol, resin, gum, fecula, woody fibre, albumen, and malic and phosphoric acids, partly combined with potash.

Water extracts its sensible qualities, and the infusion is not altered by sulphate of iron or zinc, nitrate of silver, bichloride of mercury, tartarized antimony, the mineral acids and alkalies; nor is it precipitated by gelatine or tannin. The superacetate of lead throws down a flocculent precipitate, insoluble in acetic acid, showing the presence of mucus. The alcoholic tincture is of a bright greenish colour, and becomes turbid by the addition of water.

"On distillation a white pearly fluid collects in the receiver, strongly impregnated with the aroma, but less bitter than the root. This fluid on standing deposits round the edges of its surface small crystals of camphor."—*Bigelow's Mat. Med. p.* 337.

---

* Bigelow's plant is from the southern states, and has twelve anthers.

C. Recluz obtained from 25 lbs. of the dried root 2 oz. 70 grs.* of essential oil, of a green colour, and having a very fragrant odour resembling that of cajeput oil.

The Virginia snake root is much used in pharmacy, and enters into the composition of many extemporaneous preparations. In preparing these memoirs of indigenous plants it is designed to give an abstract from the article on the same subject, in the very valuable "Pharmacopèe Universelle" of Dr Jourdan. His abbreviated references to the authors and works cited will be adopted and used generally hereafter in this Journal. The table of those abbreviations is given at the end of this number. Adopting this plan, we shall enable our readers to understand the language and prescriptions of foreigners. May the pharmacy of our country acquire the enviable distinction of knowing and proving whatever others have written, and selecting and appropriating all that is valuable from these foreign stores for its own use!

Decoctum Radicis Serpentariæ Virginianæ, (ra).

℞.—Rad. serpentariæ virginianæ ʒj.
Aquæ ℔ij.

The formula does not state the manner of preparation.

Infusum Radicis Serpentariæ Virginianæ, (am. b*. ww. *c. sa.*)

℞.—Rad. serpentariæ virginianæ ʒij. ad ʒiv.
Aquæ bullientis q. s.

To obtain 6 oz. of the filtered infusion (b*.) ww. prescribes 1½ oz. of the root and 1½ lb. of water; am. and *c.* half an ounce of root, half a pint of water and two hours of maceration.

The dose is one or two table-spoonsful every hour.

Infusum Cardiacum seu Alexiterium, (sa. sw).

℞.—Rad. serpentariæ virginianæ.

---

* The French drachm contains 72 grains, the pound 6912 grains.

Rad. dorsteniæ contrayervæ a. a. ʒij.
Aquæ bullientis ʒxij.
Macerate for two hours, and add to the strained infusion.
Tinctura pimente ʒiv.
Dose.—Four table-spoonsful every six hours.

Infusum Cardiacum Acetatum. (sw.)
℞.—Infusi Cardiaci ℔j.
Aceti ʒij.
Dose.—Four table-spoonsful every six hours.

Tinctura Serpentariæ Virginianæ, (am. ams. b. be. du. ed. han. lo. o. s. w. *c. vm.*)
℞.—Rad. Serpentariæ Virginianæ 1 part.
Alcohol (15°) . . . 6 parts.
Digest for several days and filter. (b. be. vm.) ams. directs one part of root and eight of alcohol (0.907);—du. ed. lo. and *c.* three ounces of root and three pints of alcohol (0. 930;)—s. one part of root and four of rectified alcohol; han. five ounces of root and two pounds of alcohol;—o. three ounces of root and two pints of brandy;—w. two ounces and a half of root and one pound of alcohol;—am. two ounces of root and three pints of alcohol; ed. two ounces of root, two and a half pounds of alcohol (0.935) and one drachm of cochineal.
Dose.—Thirty to fifty drops and upwards.

Extractum Aristolochiæ, (br. w.)
℞.—Rad aristolochiæ ℔j.
Alcohol ℔v. ad ℔vj.
After sufficient digestion press and filter; digest and then boil the residue for a short time with three parts of water; clarify the decoction with the white of an egg; mix the two liquids, distil off the alcohol and evaporate the remainder to the consistence of an extract.
The serpentaria also enters into the confectio opii, and

the tinct. cinchon. compositæ of the British and American Pharmacopœias.

The serpentaria is much used, in combination with cinchona, as a remedy in intermittent fever. The following formula has been extensively sold as "a fever and ague powder:"

℞.—P. cinchonæ flav. ℥ss.
P. serpentariæ virgin. ℥ij.
Carbonat. potassæ pur. ℥j.

This quantity is to be taken during an intermission of the fever, of which the serpentaria is an ingredient.

The following other species of aristolochia are introduced into the foreign Pharmacopœias:

1. *Aristolochia Pistolochia, Linn.* (e. w. g.) *Netzblatthohlwurzel,* (G). *Aristoloche Crenelee,* (F.)

A perennial plant of southern Europe and Switzerland. The part employed is the root (radix pistolochiæ s. aristolochiæ polyrrhizæ,) which is composed of numerous slender fibres, about six inches in length, of a yellowish grey colour, proceeding from a small head or caudex. It has an aromatic and agreeable odour, and an acrid bitter taste.

2. *Aristolochia Clematitis, Linn.* (br. f. fe. fu. g. r. w. wu. g. m. sp. z.) *Waldrebeosterluzy, Waldrebenhohlwurzel,* (G). *Aristoloche des Vignes, Clematite,* (F).

A perennial plant, a native of the temperate and warm regions of Europe.

The part employed is the root (radix aristolochiæ vulgaris, s. creticæ, s. tenuis) which is long, cylindrical, simple, fibrous, contorted, of the thickness of the little finger, smooth, of a reddish or brownish yellow on the exterior, within white or yellowish. It has a weak and slightly disagreeable odour. Its taste is sharp, very bitter, astringent, and remains long in the mouth.

3. *Aristolochia longa, Linn.* (ams. br. e. f. li. p. w. wu. *be. br. g. m. sp.*) *Langosterluzey, Langhohlwurzel,* (G). *Aristoloche longue,* (F). *Long Birthwort.*

A perennial plant of the south of Europe.

The part employed is the root, which is sometimes a foot long and as thick as the finger. It is wrinkled, of a clear brown without, and yellowish within. Its odour is very weak, its taste acrid, bitter and nauseous.

4. *Aristolochia Rotunda, Linn.* (ams. b. br. e. f. fe. han. li. o. pr. su. w. wu. *be. br. g. m. pid. sp. z.*) *Runde Osterluzey, Rundhohlwurzel, Gebærmutterwurzel,* (G). *Aristoloche Ronde,* (F). *Round Birthwort.*

A perennial plant of southern Europe.

The part employed is the root, which is almost globular, heavy, compact, tuberous, brownish and somewhat wrinkled externally, yellowish within. It has a strong disagreeable smell when fresh, but becomes almost inodorous by drying. The taste of the fresh root is acrid and bitter and remains long in the mouth, but becomes feeble and nauseous in the dry state.

5. *Aristolochia Trilobata, Linn.* (r. *be. m.*) *Dreylapphohlwurz,* (G). *Aristoloche Trilobée,* (F.)

A perennial plant, a native of Surinam and Jamaica.

The part employed is the twigs, (*stipites aristolochiæ trilobatæ*), improperly called the roots. They are long, angular, grooved, brittle, of a brown colour, and the thickness of a straw. They have a strong camphorated odour, and a strong, very bitter and aromatic but disagreeable taste.

The virtues of this species are said to be superior to those of the serpentaria.

The dose is from five to twenty grains.

There is another native species of aristolochia, which has been used in medicine, viz: the aristolochia sipho, (Dutchman's pipe,) of which the stems and bark are said to possess virtues similar to those of the serpentaria.

On the Chlorides in General, and especially on those of the Oxides of Calcium and Sodium. By Elias Durand.

The late introduction of the chlorides of lime and soda into the materia medica, as therapeutical and disinfecting agents, and the numerous and successful experiments which have of late been made with them in contagious diseases, have rendered these products highly important to the people of the United States. Our chemical manufacturers and pharmaceutists, either from want of industry or of the opportunity of becoming acquainted with the processes of their preparations, with their strength and therapeutic employment, have suffered to this day, almost without any opposition, the importation of foreign liquid chlorides, the extravagant prices of which have rendered the acquisition of these valuable agents almost out of the reach of the great majority of the public. From such causes, very few experiments have as yet been tried in this country, and the beneficial properties of the chlorides are still unknown to the greatest number of professional men and to the community. Thus the disinfecting liquors of Labarraque and Fincham have obtained popularity in the United States, and a reputation they undoubtedly deserve, but which our own preparations, timely offered to the public, would have also commanded.

However, experience has already taught us how difficult it is to change the current of public opinion, when it has once found a good channel; and in many similar instances we have let prejudices arise in favour of foreign articles, long before we thought even of venturing our own products. This want of industry, or of self confidence, has undoubtedly been very prejudicial to our interests and reputation, and we ought now to be fully awake to the new discoveries, daily made in the different branches of our profession and turn them to our own advantage and credit, by preparing these articles ourselves.

We sincerely hope that the diffusion of the present Jour-

nal among the pharmaceutists of the United States, will be the means of spreading professional and scientific informations, of raising our standing in society, and converting our habitual indifference into an active and successful emulation to follow our European brethren in the path they have opened to us. When we consider the numerous names which adorn the annals of European pharmacy, those of Margraff, Macquer, Newman, Bergmann, Sheele, Baumé, Parmentier, Brugnatelli, Van-Mons, Vauquelin, Trommsdorff, Robiquet, Pelletier, Caventou, Doërberner, Sertuerner, Labarraque and many others, we cannot help lamenting that we have as yet done so little for the advancement of our profession and reputation as a body.

The alkaline chlorides yield so gradually their chlorine to the ambient atmosphere, that they are in no way injurious nor annoying to the patients. This gaseous evolution is partly generated by the carbonic acid gas of the air, and that produced by the decomposition of vegetable and animal matter. This acid being endowed with a greater degree of affinity for the alkaline bases than chlorine itself, the latter is evolved, and the alkaline chloride is converted into a carbonate. Chlorine, possessing a great power of combination with hydrogen, another of the products of vegetable and animal decomposition, all putrid emanations are thus decomposed and finally destroyed. It is on this chemical action, as has been proved by Mr Gaultier de Claubry, that depends the efficacy of the alkaline chlorides in purifying an atmosphere loaded with pernicious effluvia, arising from disorganized matter, or generated in certain putrid disorders.

As it will be seen at the end of this article, the exhibition of the chlorides of lime and soda, as disinfecting and therapeutical agents, are very numerous and frequent, and they have, besides, been advantageously employed in the arts, and in rural and domestic economy. Their properties have been so well established in France particularly, as to entitle them to a high station among the most important of the articles of the materia medica. It is in the view of fostering, in Ame-

rica, the knowledge of their properties, preparations and employments, that I now offer to the public the following compilation, which I have derived from the best sources, and principally from the Dictionnaire des Drogues, from the last editions of Turner's Chemistry, of Thenard's Treatise on Chemistry, from the Annales de Chimie et de Physique, and other chemical works of equal standing.

On the Chlorides in general.

The word *chloride* has been applied to substances resulting from the combination of chlorine with simple or compound bodies. The chlorides are divided into two classes, viz: the *chlorides of pure metals* and *those of the oxides of metals*. The former are afforded by the union of chlorine with all, or almost all, the pure metals, and the latter, by the combination of the same gas with several of the metallic oxides. Chlorine possesses a powerful affinity for pure metals, and its attraction for them surpasses even that of oxigen; on the contrary, very few of the metallic oxides are capable of combining with chlorine, and their power of combination is so feeble that the compounds resulting from their union with this body are easily decomposed, even by the weakest acids. The chlorides of metals are very numerous, whilst those of the oxides are but few in number; of the latter, the chlorides of the oxides of barium, calcium, sodium and potassium, are the only ones, the existence of which is now well ascertained; however, Mr Grouvelle asserts that he has produced those of the oxides of magnesium, zinc, copper and iron.

Metals combine in various proportions with chlorine, and form protochlorides and deutochlorides. The quantity of chlorine required by metals to form chlorides, has been compared to the proportion of oxygen absorbed by metals to constitute metallic oxides, and it has been ascertained that the quantity of chlorine contained in the chlorides, is to that of oxygen contained in the oxides as 4,388 is to 1; consequently, a metal requiring one proportion of oxygen to be

converted into the state of oxide, will need 4.388 proportions of chlorine to constitute a chloride.

The chlorides of oxides are distinguishable from the chlorides of pure metals by this particular feature, that they possess several of the properties of chlorine gas, such as destroying vegetable colours, dissipating putrid matters, emitting chlorine, when exposed to the air, &c.

Chloride of oxide of calcium.—(*Chloride of lime, oxymuriate of lime, Tenant's bleaching powder.*)

It is difficult to trace with precision the time of the discovery of this compound. It was first prepared on a large scale in the city of Glasgow in 1798. Tenant manufactured it afterwards and obtained a patent for its preparation and employment in the art of bleaching. The composition and properties of this chloride have since been carefully investigated by Dalton, Thomson, Walter, and more recently by Dr Ure and Grouvelle, who have made us acquainted with their experiments and the analysis of this compound. It appears from the latter, that the common commercial bleaching powder is composed of thirty-six parts, or one equivalent of chlorine, and twenty-eight parts, or one equivalent of lime, and that the essential ingredient is mixed with variable quantities of hydrate of lime.

As we have just stated, the chloride of lime was first employed for bleaching, but this article has of late acquired a greater celebrity from the labours of Mr Labarraque, a Parisian pharmaceutist, who demonstrated its usefulness as a disinfecting agent. Dr Massuyer, professor of chemistry in the medical school of Strasburg, and chief surgeon to the military hospital of that city, seems to have been the first who, in 1807, employed the dry chloride of lime for neutralizing the miasmata of hospitals. Borries, an apothecary of Montpellier, proposed in 1822, the lotions of the aqueous solution of this compound as a preventive in contagious diseases; but at the same time Mr Labarraque was applying the chlorides, as disinfecting agents, to the manufacturer of cat-gut

with a success which deserved from the *Societé d'Encouragement* of Paris, the premium this institution had offered for such a valuable discovery.

Mr Labarraque, encouraged by this first trial, applied successfully his disinfecting method to dead bodies, amphitheatres, dissecting rooms, &c. and proposed its employment as a medical agent. Experiments were soon made, and it was ascertained that the exhibition of the liquid chlorides proved very advantageous in dressing ill-conditioned sores, and removing the causes of asphyxia, produced by the emission of pernicious gases from drains, sewers, privies, &c. He recommended it as a preservative in *typhus nauticus*, and the various success derived from these applications secured to the author the premium offered by the French Institute, and in 1826 he was created a knight of the legion of honour.

The employment of the chloride of lime being attended with such happy results, its exhibition was farther extended, and Messrs Chevallier and Payen applied it to the disinfection of wells of privies; but the quantity required in this instance, rendering its employment too costly, these chemists undertook, in order to obviate this disadvantage, to mix it with lime, and succeeded by these means in effecting the disinfection on a large scale of a large well of an hospital privy. Chevallier applied it afterwards with the same success to putrid stables.

Assimilating to putridity the unpleasant odour and taste peculiar to alcohols of feculas and corn, several chemists proposed the employment of chlorides for depriving them of these properties; but until now, the greatest difficulty has been encountered in fixing the exact proportion of chloride to a determinate quantity of alcohol. However, there is hardly any doubt, but that, by repeated experiments with spirits of different qualities, this point will be attained, and that this discovery will prove as advantageous to the arts, as it will be profitable to him who succeeds in this undertaking.

Preparation of the chloride of oxide of calcium.

Several processes have been employed for preparing this chloride. We describe only the principal ones.

1. The chloride of lime is prepared on a large scale, by introducing chlorine gas into a chamber, constructed in a suitable manner, and furnished with wooden shelves, upon which thin strata of recently slaked lime are exposed. This chamber is provided with two opposite windows, by means of which the operator can ascertain whether the vapours of chlorine are absorbed by the hydrate of lime. A door is contrived in one of the sides, in order to remove the chloride when prepared. Opposite to this door is an opening, through which the chlorine is introduced into the chamber. The roof is provided with a hydraulic valve to open a passage to the gas, in case of too great a dilatation.

2. Another process was employed in 1816 at Jouy, which consisted in introducing some hydrated lime into a cylinder, furnished internally with rays of narrow and thin pieces of wood, and revolving upon a hollow axis, through which the chlorine passes. By the rotating motion given to the cylinder, the combination of the gas with the hydrate of lime is greatly facilitated. When the saturation is accomplished, the chloride is removed and preserved in well closed bottles.

3. Labarraque's process consists in filling up large stone pots of an elongated form, with a mixture of twenty parts of slaked lime and one part of muriate of soda, and introducing gradually chlorine gas into them. The operation is continued until the lime is sufficiently impregnated with chlorine; and this point may easily be ascertained by the appearance of the mixture becoming moist. This circumstance is a sure indication that the operation is drawing near to its end.

4. This compound may also be obtained by introducing slaked lime into a leaden cylinder, furnished with two bungs, one of which is provided with a tube intended for conveying the pure and washed chlorine into the cylinder, and the other with a second tube, bent at a right angle, with its inferior part plunged into a vessel containing milk of lime.

The latter tube is intended to open a passage to such portions of chlorine as would have escaped combination, and would otherwise be lost, and annoy the operator.

Liquid chloride of oxide of calcium.

Solution of chloride of lime.—This liquor, which may be used both for bleaching and disinfecting, is prepared in the following manner: Rub in a mortar a quantity of chloride of lime; add to it a small quantity of water, which increase gradually so as to form a liquid mixture; let the liquor rest; decant and pour more water on the residuum; unite these solutions of different degrees of concentration and bottle them up securely. Various proportions have been proposed for preparing this disinfecting solution. The principal ones are the following:

Formulæ of

Dr Massuyer,	Chloride of lime, 1 part; water,	20 parts.
Labarraque,		48 parts.
Chevallier,		10 parts.

These solutions, as may be perceived, contain very different proportions of chloride. When this liquor is intended for disinfecting, it may be saturated. The quantity of dry chloride contained in Chevallier's formula affords thirty-two hundredths of chlorine gas, acting as disinfecting agent by decomposing the miasmata evolved from the disorganization of animal and vegetable matters.

A liquid chloride of lime may also be obtained by introducing chlorine into milk of lime, and continuing the operation until the gas be in excess.

Chloride of oxide of sodium.—(*Chloride of soda, Labarraque's disinfecting liquor.*)

This preparation, as well as the chloride of lime, may be applied to the disinfection of dissecting rooms, hospitals, prisons, ships and other places, where a great number of people are crowded together, or containing matters capable of generating putrid emanations and thus altering the purity of the atmosphere. This liquor has also been successfully

exhibited as a therapeutic agent in the dressing of wounds and ulcers of the worst character.

Different processes have been proposed for the preparation of this chloride.

Labarraque's Process.—Dissolve 640 parts of crystallized subcarbonate of soda in 2500 parts of distilled water, and ascertain whether the solution marks 12° of Baumé's areometer for salts. If the liquor is not sufficiently saturated, add as much carbonate of soda as will be necessary to effect that object. If, on the contrary, the liquid is too dense, dilute it sufficiently. The solution thus prepared, the following substances are introduced into a matrass, viz: 147 parts of bruised muriate of soda and 112 parts of peroxide of manganese; apply a cork to the mouth of the matrass and place it on a furnace. A hydrostatic funnel for the introduction of the acid is adapted to the cork as well as a safety tube, bent at a right angle, and plunging by its extremity into a Woulfe's bottle with two necks, containing water, destined to wash the chlorine. From the second neck of the bottle emerges another safety tube, whose extremity plunges in the bottle containing the solution of carbonate of soda.

The apparatus being thus disposed, the joints are luted and the lute covered over with slips of linen soaked in the white of eggs, and sprinkled with slaked lime in powder. When the lutes are perfectly dry, introduce by small portions, through the hydrostatic funnel, a mixture of 147 parts of sulphuric acid and 112 parts of water.

When all the acid is introduced, put under the matrass a few ignited coals, and raise the temperature gradually, until the disengagement of chlorine ceases. This operation completed, take the apparatus apart and test the discolouring power of the product. Labarraque has ascertained that one part of this chloride, properly prepared, will discolour eighteen parts of sulphate of indigo*. Should the quantity

---

* The sulphate of indigo alluded to by Labarraque is prepared by dissolving one part of indigo in six parts of sulphuric acid, and adding to the solution nine hundred and ninety-three parts of water.

of chlorine yielded by the mixture of muriate of soda and peroxide of manganese, and absorbed by the liquid alkali, be insufficient to give to the chloride this discolouring power, it must be charged with more chlorine, in order to afford this degree of saturation. Labarraque recommends particularly to repeat the trials for ascertaining positively the discolouring power of this chloride.

The nature of Labarraque's disinfecting liquor has been carefully investigated by Mr Philips, and principally by Mr Faraday. It appears from the experiments of the latter chemist, that, while the chloride of soda is the active principle of this compound, its properties are considerably modified by the presence of carbonate of soda. In order to obtain this preparation in a state of purity, he recommends this chloride to be made with caustic soda, or common subcarbonate of soda, but with a great excess of chlorine, in order to displace the whole of the carbonic acid.

Mr Faraday, without changing the mode of operation prescribed by Labarraque, has altered the proportions in the ingredients, and proposed the following formula as preferable to that of the French chemist. This alteration, as will easily be perceived, is calculated to afford a much larger proportion of chlorine, and a more concentrated solution of chloride of soda, than are obtained by Labarraque's process.

Faraday's Formula.—Dissolve 2800 grains of crystallized subcarbonate of soda in one pint and 28–100ths of water, and through the solution contained in Woulfe's apparatus, transmit the chlorine evolved from a mixture of 967 grains of sea salt, and 750 grs. of peroxide of manganese, acted upon by 960 grs. of sulphuric acid, diluted with 750 grs. of water. In order to remove any accompanying muriatic acid, the chlorine before reaching the alkaline solution is to be conducted through pure water, by which nearly one-third is dissolved; but the remaining two-thirds are fully sufficient for the purpose. This gas is readily absorbed by the solution, and from the beginning to the end of the process not a particle of carbonic acid gas is evolved; whereas, by ap-

plying an excess of chlorine, the carbonic acid may be entirely expelled.

The liquor prepared according to Faraday's process has all the characters of Labarraque's liquid chloride of soda. Its colour is pale yellow; it has a slight smell of chlorine, and its taste, at first sharp, saline and scarcely alkaline, produces at last a persisting and biting effect on the tongue, and it reddens the colour of turmeric paper. When boiled, no chlorine is disengaged, nor is its bleaching power perceptibly impaired. If carefully evaporated, it yields a mass of dense crystals, which, when redissolved, bleach almost as powerfully as the original liquid. When rapidly evaporated to dryness, the residue scarcely retains any chlorate of soda or chloride of sodium, but, notwithstanding, it has lost more than one half its bleaching power, and therefore a part of its chlorine must have been evolved during evaporation. This solution deteriorates gradually by keeping, chloric acid and chloride of sodium being generated. When allowed to evaporate spontaneously, chlorine gas is gradually evolved and crystals of carbonate of soda remain.

In some respects the nature of this liquid is still obscure; but from the preceding facts, drawn from Faraday's experiments, two points seem to be established: 1. That it contains chlorine, carbonic acid and soda. 2. That the chlorine is not simply combined either with water or soda, for by boiling, the gas is neither expelled as it would be from an aqueous solution, nor does the liquid yield chloric acid and chloride of sodium, as when pure chloride of soda is heated. It may perhaps be regarded as a compound of chloride of sodium and bi-carbonate of soda. Its composition may be conceived by supposing that when chlorine is introduced in due quantity into a solution of carbonate of soda, it combines with half the alkali, while the remainder, with all the carbonate of soda, forms a bicarbonate of soda. Should this salt unite, though by a feeble affinity, with chloride of soda, both may derive a degree of permanence, which neither singly would possess. During spontaneous evaporation,

the tendency of the common subcarbonate to crystallize may occasion its reproduction and the disengagement of chlorine. These remarks, however, are merely speculative*.

The liquid chloride of soda may be obtained easily, cheaply, and of an uniform strength, by decomposing the chloride of lime by the subcarbonate of soda, as has been proposed by Mr Payen.

Payen's Process.—This method, extremely simple, has been employed in the preparation of a liquid chloride, which has obtained in therapeutical exhibitions all the good results it was expected to afford. It consists in mixing one part of dry chloride of lime with twelve parts of water, letting the liquor settle during three hours in close vessels, filtering and washing the dregs with two parts more of water. On the other hand, dissolve, with a gentle heat, two parts of crystals of subcarbonate of soda in four parts of water, and let the solution cool. Then mix the two solutions together, taking care to stir the mixture well. A copious precipitate of carbonate of lime takes place, and the liquor, after settling, is decanted or filtered and bottled up securely. This liquor is the pure chloride of soda. The precipitate may be washed with water, if desired, and a weaker solution obtained, which may be employed to dissolve a new quantity of chloride of lime for a second operation.

General considerations on the utility and employment of the chlorides of the oxides of calcium and sodium.

Under this head we will enumerate the principal instances in which the alkaline chlorides have been beneficially em-

---

* This theory is given in Turner's Chemistry, but from the experiments of Mr Gaultier de Claubry, to which we have alluded in the fourth paragraph of this paper, we are inclined to think that the formation of a carbonate by the spontaneous evaporation of the liquid chloride of soda, is principally produced by the decomposition of that compound by the carbonic acid of the atmosphere. We are so much the more inclined to this opinion, that the chloride of lime, prepared from the hydrate, undergoes the same decomposition, and produces also a carbonate of lime.

ployed, and will indicate the different modes of exhibiting them in the various circumstances requiring their employment. We will divide this article into five different sections, according as the chlorides may be applied to the *arts*, to *rural* and *domestic economy*, to *public salubrity* and *therapeutics*.

1. *Arts.*—They are employed for bleaching feculas, threads, linen, paper, and for the restoration of engravings and books soiled by smoke and stains. To attain this object, the body which is to be bleached is immersed in an aqueous solution of chloride, prepared with one part of the latter to twenty parts of water, and permitted to remain in it until it has acquired the desired degree of whiteness; after which it is washed several times in fresh water, in order to carry off the portions of chloride which might have remained attached to it.

2. *Rural economy.*—Germination is rendered more active by soaking the seeds, before sowing, in a mixture of one part of chloride and nineteen parts of water. By watering from time to time feeble vegetables with water containing one sixty-fourth of chloride, their power of vegetation is increased.

3. *Domestic economy.*—They are used for the preservation of eggs and other alimentary substances; to deprive vegetables, which are kept during the winter, of the unpleasant smell they may have acquired; and liquors of the taste they frequently derive from distillation or from their dregs; and, finally, to disinfect spoiled meat. For these purposes, the eggs are put into a solution of one part of chloride of lime in thirty-two parts of water, and moved from their place every now and then. Vegetables and meat which have acquired a disagreeable smell and taste are immersed several times in water containing one fortieth or sixtieth of chloride of soda, and then washed in pure water. As for liquors, they are mixed gradually with small portions of chloride until the chlorine begins to evolve, and when settled they are decanted and subjected to distillation, taking care to separate

the first products, which are always impregnated with chlorine.

4. *Public salubrity.*—It is principally in this respect that the chlorides become really valuable, by the numerous services they render to humanity in decomposing the putrid miasmata of every kind, and preventing the generation of epidemic diseases, or arresting their progress when they already exist. They are used for destroying the infectious smell arising from privies, sewers, chamber-buckets, putrid waters, &c.; for disinfecting hospitals, prisons, fish and meat market places, tanneries, muddy streets, pasteboard pulp; for purifying the air of mines, the rooms where silk worms are raised, the manufactories of glue, starch, catgut, &c.; slaughter-houses, lumber yards, drains, stables, amphitheatres, meeting-houses, theatres, lazarets, the rooms of sick persons, wells, &c. Finally, in cases of disinterment of dead bodies for the purpose of judicial inquiries; likewise, for sprinkling over animals killed by contagious diseases; for washing the linen of sick people; for destroying the fetid emanations absorbed by cloths, and disinfecting the stores where second hand clothing is kept.

The manner of disinfecting articles in the state of putridity is by using a mixture of thirty or forty parts of water to one of chloride, and enveloping them in pieces of linen or cotton saturated with this solution, or by sprinkling them repeatedly and at small intervals with it. By these means the mephitic odours are promptly destroyed, and the danger which may result from them is thus removed.

In the beginning of the present year, 1829, the French government sent to Egypt, and different parts of Asia Minor, a committee of physicians charged to investigate the character of the plague which rages almost every year in those regions. The numerous experiments they had occasion to make with the chlorides has convinced them of the efficacy of these compounds, not only as preservatives from these dreadful diseases, but even as capable of removing the causes which generate it. By washing themselves with, and sprinkling on

their clothes the disinfecting liquor, they have been enabled to visit the hospitals, touch the sick, dissect the dead, and even to dress themselves, with impunity, with the shirts and wearing apparel of people who had died with the plague. In this last instance, they had previously immersed these clothes for sixteen hours in a solution of chloride of soda, and kept them on for eighteen hours, laying all the time in their beds. Although the clothes had been impregnated with perspiration, blood and pestilential matter, and were still stained with them, not a single one of these physicians had been in the least affected with disease twenty-two days after this daring experiment was performed.

From the success of the chlorides in these circumstances Dr Pariset, one of the principal physicians of that committee, draws the following conclusions: That the chlorides are capable, 1. Of disinfecting, at a trifling expense, all kinds of wearing apparel and goods infected with pestilence. 2. Of arresting at once a contagion, and destroying by lotions the poison produced by the first cases, and susceptible of spreading the infection. Dr Pariset has not the least doubt that not only pestilential disorders, but also varioloid, measles, typhus, and even yellow fever, may be arrested by means of the chlorides; and he concludes by asserting, that by these simple means, combined with a better police in the manner of burying among Mahometans generally, the plague will forever disappear from the surface of the globe.

5. *Therapeutics.*—Numerous applications of the chlorides have already been undertaken in a great number of diseases, and it is probable that their efficacy will render their employment still more extensive. It is at least what may be anticipated from the happy results obtained by the celebrated Dr Percy, and afterwards by Drs Marjolin, Jules Cloquet, Lisfranc, Cottereau, Segalas, Cullerier, Lagneau, Roche, Biett, &c. To these practitioners we are indebted for the knowledge we have acquired of the employment of the chlorides. They have been used to relieve asphyxia produced by gases evolved from the wells of privies, and to destroy the putrid

smell of the feet and breath. They have also been successfully exhibited in scurvy, scald head, itch and other affections of the skin; in madness, purulent ophthalmia, burns, chilblains, atonic and venereal ulcers, gangrenous sores, hospital gangrene, carbuncle, fistulous discharges, bastard blennorrhages, in ulcers of the uterus, cancers, &c. The chlorine evolved from the chlorides has, likewise, been beneficially applied to the affections of the organs of respiration. Dr Cottereau has invented an apparatus by which he introduces the chlorine into the lungs. This administration, though successful in the hands of experienced physicians, requires, however, the greatest attention and prudence in its exhibition.

In all these cases, the last excepted, the chlorides are exhibited externally. A mixture of forty parts of water, or of a mucilaginous decoction with one part of chloride is used at first, and the proportion of the latter is increased gradually, according as the sensibility of the organs diminishes, or the habitude of supporting its action requires it. The lotions are repeated from four to six times in the course of the day.

Selected Articles.

Tartar Emetic. (*Antimoniated Tartrate of Potassa. Tartarised Antimony. Tartrate of Potassa and Antimony.*) *By A. Chevallier.*

This salt is the result of the combination of tartaric acid with potassa and the oxide of antimony, in the following proportions:

According to Berzelius.		*According to Thomson.*	
Potassa	12,53	Potassa	16,66
Oxide of antimony .	27,10	Oxide of antimony .	36,81
Tartaric acid . .	53,20	Tartaric acid . .	46,53
Water	7,17		

We are indebted for the discovery of this salt to Adrian Mynsicht, who, in 1631, published an account of it in his treatise entitled "*Thesaurus Chimico-Medicus.*" Since that time many chemists, and among the rest Lemery, Baron, Bergmann, Lassonne, Macquer, Sheele, Fourcroy, Baumé, Lartigues, Henry, Soubeiran and Philips have investigated its properties and experimented upon its preparation. Bergmann described it with such accuracy, that his description would even at the present time be considered as excellent.

Many different processes have been attempted for the preparation of tartar emetic. Those described by Bergmann were founded upon the saturation of the excess of tartaric acid contained in the supertartrate of potassa, by the oxide of antimony afforded either by the white oxides or by the preparations of antimony known by the names of *crocus metallorum*, sulphurous, vitreous, &c. oxides. The different modes of prepara-

tion, according to Geoffroy, are productive of various combinations. This chemist published his experiments upon tartar emetic, and ascertained that this salt, obtained by different methods, was not identical, and contained from one eighteenth to one twenty-fifth of oxide of antimony.

Several processes are still used in the preparation of tartar emetic; those we are now going to describe are followed at the present time.

Of the French Codex.—Take sixteen parts of vitreous sulphuretted oxide of antimony (glass of antimony) well porphyrised, twenty-four parts of pulverised cream of tartar, and two hundred and forty parts of distilled water. When the powders are well mixed, place them in an earthen or silver* basin, and pour on them a sufficient portion of water; reduce the mixture to an homogeneous paste, by stirring it with a wooden spatula, and add gradually the remainder of the water. Then set the basin on a furnace, and permit the mixture to boil for about three-quarters of an hour, stirring constantly, and adding every now and then a small quantity of boiling water to make up for that which has evaporated. When the ebullition is over, let the liquor cool to about 90° Fahrenheit; throw upon a filter, and wash the residue with tepid water. Afterwards unite the liquors, evaporate to 20° of Baumé's areometer for salts, and remove from the fire. On cooling, crystals of tartar emetic will form; they are often covered with other small acicular and radiated crystals of tartrate of lime, which are easily separated from the octoedral crystals of tartar emetic by means of a small brush, which removes the acicular crystals of tartrate of lime without altering the others†.

This salt, freed from the tartrate of lime, requires to be redissolved in distilled water, and the solution evaporated to

---

* When a silver basin is employed, the metal is partially blackened by the formation of a coat of sulphurated silver.

† Mr Idt thinks that the tartrate of lime may be removed by means of water slightly acidulated with hydrochloric acid.

the crystallizing point. If this recrystallization should not afford crystals perfectly pure and white, the same operation must be repeated. A new crop of tartar emetic will be obtained from the mother-waters, to be purified by the same means*.

Several phenomena are observed during the formation of tartar emetic by the preceding process. 1. A disengagement of a small quantity of hydro-sulphuric acid. 2. The production of flocculent masses of a chesnut brown colour (kermes) floating in the liquor. 3. The solution acquires a greenish yellow colour, and frequently, when sufficiently evaporated, a gelatious appearance. These phenomena are explained in the following manner: the glass of antimony, which is a mixture of sulphuret and protoxide of antimony, &c. coming in contact with the water and cream of tartar, a part of the water is decomposed; its oxygen passes to the metal of the sulphuret, which is transformed into a protoxide, whilst its hydrogen, uniting with the sulphur, produces hydro-sulphuric acid. Part of this acid unites with a small portion of oxide of antimony, and forms kermes, the other is disengaged. The protoxide of antimony contained in the glass of this metal, and a part of the oxide produced in the operation, combine with the excess of acid of the cream of tartar, and afford tartar emetic, which remains in solution. The salt is united, 1. With a little tartrate of iron, by which the liquor is coloured green. 2. With silica, which, dissolved at first, is precipitated by the evaporation of part of the liquid in a gelatinous mass. 3. With tartrate of lime, separated by the protoxide of antimony from the cream of tartar, which contains always a small quantity of it. This calcareous salt, soluble in warm and insoluble in cold water, is precipitated in the form of needles on the octoedral crystals of tartar

---

* The tartar emetic afforded by the mother-waters is not fit for therapeutical employment, except when obtained in perfect crystals. In this state, it is always freed from the arsenic contained in the mother-waters, and furnished by the antimonial preparations from which the tartar emetic is obtained.

emetic. Mr Serullas asserts that the mother-waters contain, besides the above salts, a small quantity of arsenic. This process is also employed with some modifications in the proportions of the ingredients. Thus equal parts of cream of tartar and glass of antimony are used, instead of sixteen of the latter and twenty-four of the former*.

Philips' process.—This process, published in France by Mr Henry, was repeated, in the presence of this gentleman, by Mr Pitay, one of the pupils of the *Pharmacie Centrale*, who inserted it in the *Journal de Pharmacie*. It consists in treating the subsulphate of antimony by the supertartrate of potassa, in the following manner: equal parts of subsulphate of antimony and cream of tartar, both finely pulverised, are mixed together and thrown, by portions, into ten parts of boiling distilled water. The liquor is maintained in the state of ebullition, until it remains but slightly troubled by a greyish and insoluble precipitate; it is then filtered and evaporated to 22° of Baumé's areometer for salts; afterwards removed from the fire and permitted to crystallize. When the crystals are formed (which requires about twelve hours) the mother-water is decanted, and the salt, generally white, is separated.

The mother-water is evaporated down to 22°. It is observable that, during this operation, and principally towards the end, the liquor becomes turbid. This phenomenon is owing to the precipitation of a certain quantity of sulphate of lime; the liquor must be filtered when still warm, and permitted to crystallize anew.

The mother-water of this second crystallization contains a great excess of acid, and requires, before undergoing eva-

---

* This theory has been considered as accurate; but Mr Soubeiran, in some observations upon tartar emetic, published in the *Journal de Pharmacie* of October 1824, has opposed it, and concluded from the result of his experiments, that all the theory of the operation is confined to the saturation of the excess of tartaric acid of the cream of tartar, by the oxide contained in the glass of antimony, and that the production of sulphurated hydrogen and kermes are produced by the decomposition of a small quantity of the sulphuret of antimony.

poration, to be partly saturated with lime, (a small excess of acid is however necessary) otherwise the crystals would be impure, and covered with sulphate of lime. When the liquor has been filtered, in order to separate the precipitate, the operation is continued and new crystals produced. Should this last product prove not sufficiently white, it must be redissolved in pure water, filtered, and evaporated again to the crystallizing point.

Mr Pitay elucidates, in the following manner, the theory of this operation: "the sulphuric acid, possessing but little affinity for the subsulphate of antimony, this salt, coming in contact with the cream of tartar, is entirely decomposed: its oxide unites to the excess of acid of the supertartrate of potassa, whilst the sulphuric acid remains in solution in the liquor." Mr Soubeiran, who has since examined what happens in this operation, thinks that the theory of Mr Pitay is not accurate, and grounds his opinion upon having ascertained that the liquor resulting from the ebullition of the water with the cream of tartar and the subsulphate of antimony, contains not only tartar emetic and sulphuric acid, as Mr Pitay has asserted, but also some tartaric acid and sulphate of potassa*. He then establishes this theory: "relatively to the mass, the sulphuric acid takes up a portion of the alkali of the cream of tartar, but the acidity of the tartaric acid liberated is not destroyed; its presence counteracts the action of the sulphuric acid, and the equilibrium is established only when the tendency of the sulphuric acid to combine with the potassa is counterbalanced by that of the tartaric acid to retain this base. In this hypothesis, which to me seems the expression of the truth, the liquor would contain tartar emetic, sulphate of potassa, and besides, sulphuric and tartaric acid in the free state." Mr Soubeiran's

---

* Mr Serullas having demonstrated that almost all the sulphurets of antimony which are met with in commerce contain some arsenic, this metal, modified, must necessarily exist in the mother-waters, or among the precipitates on the filters.

observations being of a length which does not permit us to produce them all in this place, we refer our readers to the author's memoir, published in the *Journal de Pharmacie* of October 1824.

In an essay published in the first and second volumes of the *Journal de Chimie Medicale*, by Mr Henry, chief of the *Pharmacie Centrale*, this eminent pharmaceutist has undertaken to ascertain the value of the different processes for obtaining tartar emetic, according to the various methods of Mr Philips, of the French *codex*, and of the Edinburgh, Dublin and London *Pharmacopœiæ*. The conclusions he has drawn from the results of his experiments are, 1. That Mr Philips's method, although it seems at first to possess advantages, is liable to the objection, that we never know exactly on what quantity of sulphate we are acting*. In fact this salt, prepared according to the formula published by the author, contains always more or less metal, and, besides, the product seems to be contaminated by a pretty large quantity of bitartrate of potassa; 2. That the process of the French *Codex* requires a tedious manipulation to obtain crystals of pure tartar emetic, and although the expense seems but trifling, yet when we take into consideration the value of time and labour, we soon perceive that there is no advantage in adopting it; 3. That the two processes of the Edinburgh *pharmacopœia* can bear no competition. The author pronounces in favour of the Dublin formula, which consists in preparing tartar emetic with four ounces of subchloride of antimony, 4 oz. 2 drs. and 18 grs. of cream of tartar, and three pounds of water. The following is the Dublin process, modified by Mr Henry:

Dublin process, amended by Henry.—Sulphuret of antimony, 16 parts; hydrochloric acid, of 22°, 88 parts; nitric acid, 1 part. Introduce the sulphuret reduced to a very fine powder into a glass mattrass of the capacity of at least

---

* The American Pharmacopœia has adopted the process of Mr Philips. *Trans.*

double the volume of the whole mixture; mix the two acids together, and pour about two or three pounds of this mixture upon the metallic powder, so as to wet it completely with the liquid; add then the remainder of the acids. Set the mattrass on a sand-bath and carry the liquor to the boiling point over a moderate fire. A considerable disengagement of gaseous vapours takes place, which the operator should avoid; the ebullition is continued until the gas which is disengaged is sufficiently deprived of sulphurated hydrogen not to blacken a piece of white paper impregnated with a solution of acetate of lead. The liquor is then permitted to cool and settle until it becomes quite transparent; and to obtain the last portion, which is partly soaked by the residuum, the latter should be washed with a small quantity of hydrochloric acid, decanted and united to the former liquid. This solution will afford the Algarotti's powder (subhydrochlorate of antimony) which is produced in the following manner:

The solution is poured gradually into a large quantity of water, stirring at the same time so as to obtain a precipitate minutely divided, and capable of being washed more accurately. The following is the mode of ascertaining whether the quantity of water employed in this operation is sufficient: When the liquid chlorate of antimony has been thrown into the water, let the mixture settle; take some of the supernatant liquor, and if by pouring on it a fresh quantity of water it is not rendered turbid, all the salt has been decomposed; but should it continue to form a precipitate, it is necessary to add more water, in order to obtain the greatest quantity possible of subhydrochlorate of antimony. All the precipitate being obtained, it is washed repeatedly until the water which has passed over it contains no more acid, and does not redden litmus, or tincture of violet. The precipitate is then collected on a piece of linen and permitted to dry.

Take first, 100 parts of this dry antimonial powder; second, 145 parts of pulverised cream of tartar; third, about 1000 parts of water. Boil the latter in an iron kettle, mix

accurately both powders, throw them into the boiling water, and evaporate rapidly, until the liquid marks 25° of Baumé's areometer for salts; filter then the liquor and let it crystallize. Tartar emetic soon begins to form in the bottom, and in the course of twelve hours the crystallization is accomplished. The mother-water is decanted, and the tartar emetic, which generally does not require purification, is dried for use.

After having saturated with chalk the excess of acid contained in the mother-water, it is filtered and united with the liquor obtained by washing the paper which has been used in the first filtration, and the whole concentrated to 25°. Thus a new crop of crystals of tartar emetic is produced, and the mother-water, separated again and evaporated in the same way, afford yet a third crystallization. These two last products are slightly coloured by a small quantity of iron, and require to be purified by new crystallizations. It would be useless at this point to undertake to obtain more tartrate of antimony and potassa from the mother-waters; such as they would then afford would be contaminated with foreign salts. The whole of the details given by Mr Henry on this subject being too extensive to insert in this place, we refer our readers to his memoir published in the Journal of Medical Chemistry.

Tartar emetic is a colourless salt, more soluble in warm than in cold water. Boiling distilled water takes up one half of its weight, and cold water about one fourteenth. It crystallizes in octoedral and sometimes in tetraedral crystals, reddens litmus, and possesses a peculiar nauseous taste. In contact with the air it effloresces, and is decomposed by the action of heat; in this instance the tartaric acid is completely destroyed, and the residue is potassa and oxyde of antimony.

Taken internally tartar emetic induces vomiting, and proves poisonous in large doses. In this latter case, exciting the vomiting by administering large draughts of warm water, and tickling the larynx with the feather of a quill, are proper, and then astringent solutions prepared with nut galls,

oak, willow and Peruvian barks, tea, pomegranate, &c. are to be exhibited.

The principal tests of this salt are,

1. Sulphurated hydrogen, which produces in its solutions a red brown precipitate (kermes).

2. The hydrosulphates, by which similar precipitates are obtained.

3. The infusion of galls which forms a floculent precipitate of a greyish colour. This precipitate, dried and submitted to the blowpipe is reduced to the metallic state, after having afforded the products resulting from the decomposition of vegetable matters.

4. The solution of tartar emetic is precipitated white by the hydro-ferro-cyanate of potassa, (hydro-cyanate-ferruré de potasse).

According to Henry's experiments, pure tartar emetic is not precipitated, 1. By hydrochlorate of baryta; 2. By the neutral oxalate of ammonia; 3. By the supernitrate of silver; and, 4. By the superacetate of lead.—*Dictionaire des Drogues.* E. D.

Observations on Sarsaparilla and its preparations, with incidental remarks on certain other remedial agents in the cure of obstinate chronical disorders. By John Hancock, M.D. Fellow of the Medico-Botanical Society, Vice President of the Philosophical Society of British Guiana, Corresponding Member of the Zoological Society, &c.

The admirable effects, and consequent high price of the article in question, has induced the inhabitants of those countries from whence it is imported, to gather it from all the different species of smilax, the roots of which have any resemblance to the genuine sort, and even from some other plants of different families. Till a very recent period, the

people of Essequibo mistook for sarsa even the pendent fibres (*not roots*) of a species of climbing arum, with large heart-shaped leaves; and, however gross the error, I found certain medical practitioners there indulging in the belief of its being the genuine drug, and employing it as such! We cannot be surprised, therefore, to find the European market deluged with false kinds of sarsa, which sufficiently accounts for the little credit given it by many of the faculty, both at home and abroad.

Of the six or eight species of smilax which I have observed growing in the woods of Guiana, I never found but one to manifest to the taste any thing of the sensible qualities of the genuine medical sarsa; the rest being, for the most part, perfectly insipid in the mouth and fauces, and, as far as my experience goes, nearly inert as remedies. In reference, indeed, to medicinal powers, there are evidently two distinct divisions of this genus of plants, although we know of no botanical characteristics for thus distinguishing them into two sections. Botanical analogy seems entirely to fail us in this instance. It appears fully evident, however, that of this numerous genus but a very small proportion indeed are to be considered as possessing any very marked medicinal properties.

The species just alluded to, as possessing some active properties, grows on the declivities of the hills and mountains up the Essequebo, and doubtless in various other parts of the interior. The stem is round, armed with short curved spines; the leaves are oblong, pointed, distant, smooth and glossy; the root is a tuber, with numerous divergent fibres, of two or three lines in thickness, and several feet in length.

Unfortunately, the traveller's attention is absorbed by a vast variety of interesting scenes while traversing the Guiana forest, and he is prone to neglect special objects. I have no doubt, however, that the Rio Negro sarsa will one day be found growing abundantly within the limits of British Guiana; and whoever makes this discovery will confer

an inestimable benefit on the public. Not only this, but the discovery of the true ipecacuanha plant, and the cinchona tree, are amongst the important discoveries which may be anticipated in Guiana, either upon the plains, or on the range of its interior mountains. Such discoveries are to be expected from the *real* botanist, who combines a knowledge of the external forms of plants, with the more important science of their intrinsic properties, their application to medicine, to the arts, and domestic economy*. I must here observe that, from my examination of samples of the genuine drug from the Rio Negro, as it arrived at Angustura, with parts of the stem adhering, it appeared that the species described by Willdenow, as the *smilax syphilitica, caule aculeato tereti aculeis axillaribus*, is not that which is regarded as the true and more active species, which has no axillary spines, and may therefore still be considered as a *nondescript* species. The natives, (the Mandavaces of Cassiquari,) of whom I made inquiry, denied that the true kind was to be found on the banks either of the Cassiquari, or the Guiana, as they call the Rio Negro. I placed the more reliance on this information, as these were *Peones* who had been employed in digging the sarsa, which, as they asserted, was chiefly obtained on the elevated lands of the Rio Imiquen, at Unturana and Caraburi. They acknowledged too, that, when the right sort was not found in plenty, they sometimes dug one or two others, which they esteemed to be nearly equal in quality.

The sarsa of the Rio Negro, which comes by way of Angustura, or of Para, is the best. Respecting this species, indeed, I can speak with confidence, having had very ample experience of its medicinal properties, especially in Angustura, where I lived nearly four years. It is the only remedy used for the cure of venereal affections, and many others

* The present would be a most favourable time for a botanist so inclined, to set about an enterprise of this nature, as he would find, in the enlightened governor, Sir Benjamin D'Urban, the support of a zealous and unaffected patron of science.

falsely considered as such, in the Orinoko; not to mention its great power in rheumatism of long standing, and in a multiplicity of chronic complaints.

The sarsaparilla which is usually met with in the shops, however, is, for the most part, nearly inert, either from age, or being procured from various non-medicinal species. It should be taken from recent importations in the *roll*, and not that which is kept slit up, in the shops, which is very often quite useless. Good sarsaparilla has a peculiar nauseous acrimony when chewed; and this is almost the only criterion we have for judging of its medicinal activity.

It is quite amusing to observe the diverse opinions respecting the nature and properties of this medicinal root. In Mr Rennie's Supplement, p. 384, it is stated, that "genuine sarsaparilla is covered by a brown or reddish bark, with a central woody portion, soft, white, and sometimes like starch. This part is useless, the virtues residing in the bitter principle of the bark; and the more it inclines to a red colour, it is the richer and more powerful. The gray and dirty-brown sorts are not good. The best sorts come from Jamaica and the Brazils, called Lisbon sarsa; the worst from Honduras and Vera Cruz. (Pope.)" Here, it would appear, that it is only the thin pellicle of bark, a sort of epidermis, which is allowed to possess any useful property; and the *colour* of this pellicle is the only character called in for discriminating the different kinds, or for judging of their medicinal powers!

The fact is, the real and only criterion for knowing good sarsa, is almost universally neglected, viz. its sensible quatities in the mouth; and which affords the best and most effectual guide for enabling us to judge of the intensity and value of vegetable remedies in general. It is by the taste and odour chiefly that we judge of good Peruvian bark, rhubarb, jalap, &c.; and even the speculators about cinchonine would be guided more by such tests, in choosing good bark, than by their hypothetical ones of glue and tan.

The medicinal properties of sarsaparilla, moreover, are not

confined to the bark so called, but are found to reside almost equally in all parts of the root, as the cuticle, woody, and farinaceous portions. This has been fully proved in Demerara, by the results of their separate administration in actual disease. The same will easily be believed by a trial of their sensible effects on the mouth and fauces.

The medicinal powers of sarsaparilla, I am inclined to believe, depend on a certain *acrid* or *nauseous* matter, or on a principle similar to that of ipecacuanha, judging from its sensible qualities and clinical effects; and this acrimonious or nauseous matter, which I find to exist in the more active medicinal sarsa, is, in some measure, covered or concealed by its demulcent or mucilaginous particles, which may also contribute something to its curative powers, added to the diluting effects of the water employed. As sudorifics, their action seems to be similar. So also, in emetic properties, when the sarsa is taken in large doses, and not spoiled by long boiling. However this may be, I suspect that ipecacuhana might, in many cases, be employed with equal advantage where sarsa is indicated. This, however, I know from sufficient experience, that the powers of sarsaparilla are, like those of ipecacuhana, quite destroyed by long boiling. It is true, indeed, that the condensed vapour arising from both is perfectly insipid; but it is, with regard to ipecacuanha, well known that, "though the water distilled from it has scarcely any emetic effect*," it becomes nearly inert by long coction; and precisely the same is true with regard to the sarsa.

After long boiling, indeed, the peculiar *odour* which rises abundantly on the coction of *good sarsa*, is almost extinguished. From the sarsa prepared in this way I found no sensible results upon any patient, nor were its peculiar nauseating, drowsy, and racking effects produced by a large quantity, although the decoction of six or eight ounces were tried at a dose.

---

* Murray's Mat. Med. p. 322.

These experiments having been carried to a sufficient length, most of the same patients recovered under the use of the sarsa, taken from the same parcels as before, but now prepared by simple maceration in hot water, *i. e.* affused in a boiling state, and kept near the boiling point for some hours. In all cases the sarsa was directed to be well bruised in large mortars, and in the mean time all other remedies were abstained from, which might, in any way, affect the result.

Knowing, then, the destructive effects of long boiling on this drug, we cannot wonder at the doubtful and discordant reports given of it by our medical and pharmaceutical writers, after they have directed it to be *boiled down to one half*, &c. which must truly render it very nearly useless and inert.

Another preparation, still more preposterous, appears to be exceedingly in vogue at the present time; that is, to boil down the decoction of sarsa into an extract. By this absurd practice, its virtues are still more completely destroyed. It is much to be lamented, that such vast quantities of this valuable root are thus thrown away in vapour, a *boiled*, if not a burnt offering, to the goddess of folly. On entering some of the shops in London, where this process is carried on upon a large scale, we find the rooms teeming with the effluvium, which may be regarded as the active principle, or, at least, as an element necessarily connected with it; since we find that, in proportion as we drive off this odorous principle by heat, we despoil this remedy of its active properties.

Mr Brande remarks, at page 404 of his very useful Manual of Pharmacy, that, "there is much difference of opinion respecting the activity of this extract, (as directed by the College), among those who admit the efficacy of other forms of sarsaparilla. It is certainly the worst preparation of that remedy, as it is usually met with, for it is *easily decomposed by heat*, and always suffers more or less during the protracted evaporation that is required." These remarks

are exceedingly just, and similar ones have been made by Murray and Thompson, yet they seem to be entirely disregarded by the practical pharmaceutists, perhaps because they consider them not to be derived from actual experiment.

As prepared by the College directions, the extract must certainly be quite inert; and it would seem, that some presentiment was entertained of its inefficacy, for, by way of compensation as it were, it is directed to be given in the *decoction* of the root! But certain sages of our profession have assigned to this useless extract, and to that not less useless syrup of sarsaparilla which is prepared from the extract, their best offices, when, in prescribing the decoction, they say "*thicken* it with extract, and *sweeten* it with syrup!" We have seen those boasted extracts and syrups used in great quantity, and at great cost, but in vain; when afterwards a quart of the strong infusion has removed all the violence of the symptoms.

In speaking of the deterioration of sarsaparilla by long boiling, I have only insisted on that which depends on the loss of its active principles by evaporation; but that which arises from the action of the air and heat, during a tedious process of boiling, must, in a great measure, subvert its affinities, form insoluble compounds, and precipitate such of the active materials as may not be dissipated in vapour. It is doubtless the latter, however, or the evolution and loss of its volatile parts, which proves the most injurious.

The boiling *in vacuo*, as it is rather improperly termed (for we can scarcely consider it a vacuum where the space is continually occupied by the production of aqueous vapour), is said to be a vast improvement in the preparation of decoctions, extracts, &c. It doubtless will be an advantage where much boiling is *really necessary*, principally by avoiding the access of air, smoke, and sooty matter, by which the extracts will at least appear more clear and pleasing to the eye; but it will by no means obviate the main objection just stated to the process of boiling, while it is far too operose and expensive for general use; and if, as asserted, the at-

mospheric pressure be taken off, it will not only facilitate the evaporation of the water, but that of the volatile elements of the drug likewise. There is, however, no occasion whatever for boiling: if the drug be duly bruised or reduced to a gross powder, the affusion of boiling water and digestion therein, just below the boiling point, will extract the active properties of this or other vegetable remedies, as completely as could be done by the longest coction, and without the loss or dissipation of their volatile parts*; and when required, it may be effected with a very small quantity of fluid, if a powerful press be employed after due maceration in hot water. The medicinal properties of dried vegetables, may thus be extracted as perfectly as could be done by expressing their juices in a fresh or green state. Those containing resinous principles, require, of course, a similar operation with alcoholic menstrua or proof spirit. This method would be the most expedient for procuring unaltered the native properties of all those remedies depending on volatile or fugacious principles, as in the narcotic drugs, or those containing essential oils, for example, hemlock, henbane, savine, &c.

Over such preparation as I have just deprecated, that employed by the Spaniards of the Orinoko is indisputably superior. There, it is prepared constantly without boiling, either by digestion in wine, or a spirituous menstruum, or by an infusion with water, allowing it to stand for eight or nine days exposed to the sun's rays, or by a fire side in the rainy season, and forming thus a strong vinous or fermented liquor. After my return from the Orinoko to Demerara, in

---

* It is the *ebullition* or *intestine motion*, caused by the heat, which elevates and drives off the aqueous vapour and the volatile parts of the infusion along with it. When at the temperature of 212, the water is progressively converted into steam at the bottom of the vessel, its elasticity or expansive power then overcoming the weight of the superincumbent atmosphere. By raising the heat, therefore, to the boiling point, we rapidly increase the evaporation, whilst the solvent power of the water remains nearly the same as when a few degrees lower.

January 1818*, I had opportunities of trying its action on numerous patients in every way I thought proper; and I found, by a long series of experiments, that the fermented infusion was equally as efficacious here as in the Orinoko.

---

* Early in this year I published, in the Guiana Chronicle, the Spanish recipe for the Jarave, so called, or diet drink, after which the use of the sarsa became very general in the colonies. The following is a somewhat modified and improved form of this recipe:—Take of Rio Negro sarsa, bruised, 2 lb.; bark of Guaiacum, powdered, 8 oz.; raspings of guaiac wood, anise seeds and liquorice root, each 4o z.; mezereon, *bark* of the *root*, 2o z.; treacle, 2 lb.; and a dozen bruised cloves: pour upon these ingredients about four gallons of boiling water, and shake the vessel thrice a day. When a fermentation has well begun, it is fit for use, and may be taken in the dose of a small tumblerful twice or thrice a day.

The publication of the recipe, at least gave an impulse to the employment of sarsa in the colony. At first it was prepared according to the Spanish process, and which certainly produced the most beneficial results,—surprisingly so it might be said, for many spoke of it as effecting very extraordinary and unexpected cures, even in old invalids, or those who had been for a long time entirely crippled.

Some years afterwards, many were found to complain that they had not experienced that efficacy in the *decoction* which had been reported. It was soon perceived, on inquiry, that the persons who had been thus disappointed were, for the most part, those who had confounded the preparation with that of the old *decoction* of woods, prepared by long boiling.

The recipe, or formula, having been anonymously published in the gazettes, which are seldom preserved in Demerara, in a short time after no indication was left for recurring to it. Many people would send to the druggists' shops for the articles, and some not even knowing what was meant, would send for the *decoction of the woods*. They received the packages, of course, with a very small portion of the more active article, sarsa, (it being the dearest one), put up in the old way, and with the usual pharmacopœial directions, by which it was boiled till quite exhausted of all active properties. This affords an example of the dilapsus and neglect of many of the most valuable remedies from mere carelessness and inattention.

If intended for old and obstinate complaints, as leprous affections, elephantiasis, various anomalous ulcerations, and foul disorders of the skin, there was added to the jug a solution of tartrate of antimony, with muriate of mercury and ammonia, viz. antim. tar. 12 grs. hydr. oxymur. 8 or 10 grs. mur. ammoniæ, 1 drachm. These three articles, being previously dissolved in a little water, are to be thrown into the jug, when the infusion has well begun to ferment, not before, as they would prevent the fermentation taking place. The addition of those active ingredients not only greatly enhances the alterative power of the vegetable infusion, but, at the same time, so effectually prevents its decomposition that it may be kept for a long time quite unaltered, even in a hot climate,—a circumstance of great moment where it is frequently required for a number of patients.

It appears to me very probable, that the acetous and alcoholic principles gradually evolved in the course of the fermentation, serve more effectually to extract the active properties of sarsaparilla than can be done by any other method we are acquainted with. There seems to be a certain fixed principle in the sarsa from Para and the Rio Negro (and probably in other kinds also), which is not so completely taken up or dissolved by boiling water; for after exhausting half a pound of this sort by two digestions, boiling, and pressure, I added to the dregs half a pint of proof spirit, and digested this with a gentle heat for a few hours in a close vessel, then affusing hot water to the amount of that taken off from the first boiling, and pressing again, I procured, by this last operation, about four pints of an infusion, which possessed the acrid properties of the sarsa, in a much higher degree even than that obtained by the first decoction with simple water.

I once mentioned such a formula in conversation with a chemical critic, who in the fulness of his wisdom, scouted the idea of such a compound, and pronounced most dogmatically, that between the tartarized antimony and muriate of mercury, the *whole* would be *decomposed!* I merely requested he would try it and convince himself, but heard no more from him. The truth, is no change whatever occurs from this admixture. Where the articles of the solution separately employed, there would be a trifling decomposition in the vegetable infusion; but these three articles being first united, form the most effectual conservative compound which it is possible to devise, either for vegetable or animal substances; and they so bind the different elements as to render them, for a long time, quite inseparable from exposure to light and air.

For some fastidious and delicate people, a variation was, at times, requisite, in which case the infusion was taken by itself; and, in lieu of the above solution, very minute doses of calomel, or the grey oxide of mercury, with precipitated sulphur of antimony, in pills, were substituted, as a quarter of a grain of the former with half a grain of the latter, night and morning.

[To be continued.]

Minutes of the College.

At a meeting of the College, held September 29th, 1829, the following communication was read, and referred to a committeee consisting of D. B. Smith, Geo. B. Wood, M.D. E. Durand, J. P. Wetherill, J. Farr, and J. Carter.

To the College of Pharmacy.

The object of the present communication is, to call the attention of the College of Pharmacy to some circumstances connected with the preparation and sale of the *spirit of nitrous ether*. This valuable medicine is so extensively used in all parts of our country, and is prescribed by physicians in the treatment of so many diseases, that it is highly important it should always be found ready for administration of an uniform and unvarying strength and quality. It is however a fact, which though it may be regretted cannot be denied or concealed, that, owing to causes which will presently be adverted to, there is perhaps no one article of the materia medica which the sick man takes with as much uncertainty. There are, I believe, no means known by which the proportion of pure nitrous ether contained in any specimen of the article can be ascertained; consequently it can only be obtained of uniform strength by preparing it always with care by the same formulæ: but chemists have no standard for the preparation of this medicine, each using such proportions as he may think proper; and moreover, some of them prepare it of at least two qualities, making what they call a *strong* and a *weak* sweet spirit of nitre.

A further difficulty arises from the property which good spirit of nitrous ether possesses of being susceptible of copious dilution with alcohol and water, without the sensible properties of gravity, taste, and odour being altered in a corresponding degree—thus unfortunately inducing vendors sometimes to reduce its quality in order to meet the wishes of their customers in regard to price; and probably in some instances dilution is resorted to from an apprehension that the article which they procure may be *too strong* for ordinary sale. As a consequence, this preparation may be found in the warehouses of our chemists and druggists at various prices, from fifty or more down to twelve and a half cents per pound, and probably varying in strength in degrees as great as indicated by the difference in prices. As a single instance of the great want of information which prevails with respect to the nature of this medicine, it may be worth while to mention that a southern druggist, who is also a practitioner, recently ordered from a manufacturer here, a quantity of "*good sweet spirit of nitre,*" with a limitation of ten cents per pound for the price!

The great imposition and uncertainty to which, in this state of things, physicians and patients are alike subjected, is obvious, as either one of all these varying preparations may be, and is taken to supply a prescription calling for spirit of nitrous ether.

I have been prompted thus to bring into view these facts, with which many members I am aware must be already acquainted, by a belief that the College of Pharmacy possesses the power of remedying the evil very materially, if not of removing it entirely.

It is suggested that this most desirable object might be effected if a formula for its preparation were established, and the college were to recommend that the article be always *sold as prepared, without any alteration.* That there would be a concurrence in such a measure by all the respectable manufacturers can scarcely be doubted; and the druggists and apothecaries, it is to be hoped, would generally be

willing to submit to some temporary inconvenience for the promotion of the public good.

The subject is accordingly respectfully submitted to the consideration of the college.

JOHN CARTER.

The committee made the following report to the meeting held November 24, 1829.

To the Philadelphia College of Pharmacy.

The committee appointed at the last meeting on the subject of sweet spirits of nitre, report that they have received the annexed communication from John Carter, respecting the mode of preparing it in the laboratory of John Elliot. They have made inquiry as to the formula used in other laboratories, and have reason to believe that they do not materially differ from this. A formula nearly similar is given in Coxe's American Dispensatory, as having been used in this city many years ago by a chemist in large business. In Dr Coxe's formula, neither the specific gravity of the alcohol nor of the spirit of nitrous ether is given. As the recipe before us affords a result nearly similar to that of the London and Edinburgh Pharmacopœias; namely, a spirit of nitrous ether, having a sp. gr. of .834; we recommend the publication of this recipe in the Journal of the College. This mode of preparing nitrous ether has been generally adopted in the German Pharmacopœias, some of which order a portion of black oxide of manganese, so as fully to acidify the whole of the nitrous gas disengaged.

Your committee cannot close this communication without noticing the practice of our wholesale druggists of diluting this spirit. The price at the manufacturer's of the standard quality is from thirty to thirty-five cents. But it is often ordered to be diluted twice, three times, and even four times its weight of alcohol and water. The ease with which the specific gravity of the genuine spirits of nitre dulc. can be attained by mixtures of alcohol and water, deprives us of the use of that test of its purity, and compels us to trust al-

most entirely to the fidelity of the chemist in preparing this important medicine. The committee may further point out the necessity of preserving spirits of nitre dulc. in small and accurately stoppered vessels. The apothecaries in Berlin are compelled by law to keep it in half pint bottles, and all that is found in larger quantities by the inspectors of medicines is condemned and forfeited. We have no such laws, happily, in America, but the careful apothecary will profit by the lesson.

Signed on behalf of the committee.

DANIEL B. SMITH.

For making Spirit of Nitrous Ether.—Into a copper still of eighteen or twenty gallons' capacity, furnished with a pewter head and worm, are put eighteen pounds of purified nitre, twelve gallons of alcohol of 34° Baumé, and 12 lb. concentrated sulphuric acid. The mixture is gently heated for about two hours, and the temperature then raised so as to bring over the spirit of nitrous ether in a small stream, and the distillation is continued until ten gallons are obtained. It is rectified by redistillation from a little hydrate of lime, or carbonate of potash or soda, adding about a gallon of diluted alcohol, so that ten gallons of the rectified article may be obtained. It is necessary to put the whole product into a large glass vessel, and mix by agitation, as the portions which first come over contain the largest proportions of nitrous ether. Previous to redistilling, the head and worm are well washed with water, as a little acid comes over in the first distilling and acts slightly upon the metal: when rectified it does not sensibly affect it. The spirit of nitrous ether thus procured has a specific gravity of .833 at 65 Fahrenheit, and when recently prepared does not fully redden litmus, though it renders it less blue.

J. C.

The committee appointed at last meeting report, that the Commencement was held on the evening of the 23d instant, when diplomas were delivered to the several candidates for the degree of *Graduate in Pharmacy*.

Some specimens of concentrated pyroligneous acid, acetate of lime, and acetate of soda, prepared at the laboratory of Mordecai and Samuel N. Lewis, were presented by them to the college.

The following gentlemen were duly chosen trustees at our semi-annual election:

Benjamin Ellis, M.D., Algernon S. Roberts, Charles Schaffer, Jun. Samuel P. Griffitts, Jun. John Price Wetherill, Samuel F. Troth, George B. Wood, M.D. and William Hodgson, Jun.

A committee was appointed to revise the rules and regulations and by-laws of the college, consisting of Daniel B. Smith, Elias Durand, Samuel P. Griffitts, Jun. Edward Needles, and Charles Ellis.

October 27.—A letter from M. Robiquet, secretary general of the Societé de Pharmacie of Paris, acknowledging the receipt of a letter addressed to him on behalf of this college by the secretary, together with a certificate of foreign membership, was read.

A report from the committee upon the constitution was read and accepted, and the revised constitution was laid upon the table.

November 24.—A letter from J. J. Virey, M.D. titulary member and secretary of the Section of Pharmacy of the Royal Academy of Medicine of Paris, addressed to the members of this college, acknowledging the receipt of our certificate of foreign membership, was read.

A communication was read from Mr E. Durand, respecting the spontaneous formation of crystals in oil of turpentine, under the following circumstances:—A bottle containing a filtered solution of mustard seed in oil of turpentine, was exposed to the ordinary light and heat of the shop (the temperature about 60°) since 1826. A few weeks ago Mr Durand discovered on the sides of the bottle above the liquid a crop of crystals. These he collected, and a new crop soon afterwards appeared in the same situation. When washed with alcohol they presented the following characters:—In

shape, four sided prisms, perfectly white and transparent, from three to five lines long, almost tasteless and inodorous, and cracking under the teeth like native sulphate of lime. Specific gravity .950. Insoluble in water; soluble in alcohol, ether and alkalies. Reddened and decomposed by sulphuric acid, evolving the peculiar odour of decomposing turpentine. Decomposed by nitric acid. Heated over a lamp they readily fuse and vaporize; but if withdrawn in a fused state and cooled, they form beautiful tufts of perfectly white acicular silky crystals. In contact with the flame of a lamp they ignite and burn with a white flame, leaving no residuum, and emitting a thick black smoke, like that from the combustion of oil of turpentine. These crystals were very slowly formed. Light appears to have been essential to their generation, as another portion of the mixture kept in a dark place yielded none; and while that producing the crystals became more limpid and whiter, the other retained its yellowish hue. From several points of resemblance between these crystals and the oil of turpentine, Mr Durand is disposed to think that they are composed of the same elements as the latter, and that the mustard seed had no agency in their production. He thinks if the sulpho-sinapic acid discovered in these seeds by MM. Henry, Jun. and Garot, could have united with the turpentine, as hydrochloric acid does to form artificial camphor, the sulphurous smell would have been evolved during decomposition.

Miscellany.

The following communication has been handed to us by our friend, Mr E. Durand, but came too late for insertion amongst the original articles.

Caoutchouc.—Dr J. K. Mitchell, professor of chemistry in the Philadelphia Medical Institute, has discovered a mode of making sheet-caoutchouc, possessed of very remarkable qualities. It is eminently soft and pleasant to the touch, possesses very great extensibility, without the exertion of much force, and may be made so thin as to appear colourless and transparent, yet retaining considerable strength and tenacity. When a sheet is folded and cut, or when two pieces are laid together and cut with scissors, the cut edges adhere with considerable force, and indeed after some hours maceration, adhere as strongly as the rest of the sheet. In that way tubes, bags, socks, caps, luting joints, &c. water and air tight, may be made. Its impenetrability and softness render it applicable to the treatment of many local diseases, especially chronic rheumatism.

Its properties and uses are so very similar to those of the sheet-caoutchouc made by Mr Hancock of London, that the identity of them is highly probable. Mr Hancock conceals his process: but Dr Mitchell, more liberal, and confident that his discovery may be eminently useful to the whole world, has not hesitated a moment to divulge it, and has authorized me to publish in this Journal the experiments he has made in my presence, and which I have repeated with the same success. Dr Mitchell forms his preparation by

soaking the caoutchouc in ether until soft. In that state it may be cut into plates or sheets, with a wetted knife, without difficulty, or the sheets may be stretched to a great extent. If caoutchouc *bags*, so softened, be inflated through a stopcock by the breath, they are often expanded to a great size. One, now in Peale's museum, which weighs only seven ounces, measures six feet some inches in circumference. The inflated caoutchouc does not, when liberated from pressure, contract much.

Dr Mitchell has also discovered a very good solvent for caoutchouc. It is the essential oil of sassafras acting on the article after it has been softened by ether. This solution will, when dry, and it dries in a day or two, present a thin pellicle of pure caoutchouc, which can, by wetting it with water, be separated in a sheet from glass and porcelain. Applied to the surfaces of torn or cut caoutchouc, it causes their firm and inseparable adhesion. Silk treated with it remains *apparently* unchanged, but becomes water tight.

Note.—When very thin caoutchouc, prepared as above, is applied over the mouth of a glass jar, it adheres without the existence of any ligature, and permits, through its transparency, the inspection of the contents of the jar. As it is attacked by no insects, and cannot be gnawed by vermin, its protecting influence greatly exceeds that of any thing but glass itself. It has also the convenient quality of durability, the same pieces being susceptible of repeated applications, because very few chemical agents act on them.

E. D.

Explanation of the Abbreviations in the Pharmacopée Universelle. By A. J. L. Jourdan. Paris, 1828.—As this work is a conspectus of all the most noted pharmacopœias in the world, and as we shall often have occasion to introduce some of its formulæ into our Journal, we thought it best to transfer the list of abbreviations prefixed to it entire to our pages.

The dispensatories and formularies are indicated immedi-

ately after the formulæ or medicinal substances resulting from them, by the following letters, after each of which will be found inscribed the title of the work it represents.

a—Pharmacopœia Austriaca. Erfurt, 1820, 8vo.

am—The Pharmacopœia of the United States of America. Boston, 1820, 1 vol. 8vo.

ams—Pharmacopœia Amstelodomensis Nova. Amsterdam, 1792, 1 vol. 4to.

an—Pharmacopœia Manualis. Anvers, 1812, 1 vol. 8vo.

b—Pharmacopœia Batava. Amsterdam, 1805, 1 vol. 4to.

*b** designates the additions and notes of Niemann.

ba—Pharmacopœia Bavarica. Munich, 1822, 1 vol. 8vo.

be—Pharmacopœia Belgica. The Hague, 1823, 1 vol. 4to.

br—Dispensatorium Pharmaceuticum Brunsvicense. Brunswick, 1777, 1 vol. 4to.

d—Pharmacopœia Danica. Copenhagen, 1805, 1 vol. 4to.

d d—Pharmacopœia Militaris, oder ausgewæhlte Sammlung Arzneymittel fuer den Militair stand, 1818, 1 vol. 12mo.

du—Pharmacopœia Collegii medicorum regis et reginæ in Hibernia. Dublin, 1807, 1 vol. 8vo.

e—Pharmacopœia Hispana. Madrid, 1798, 1 vol. 8vo.

ed—Pharmacopœia Edinburgensis. Edinburgh, 1813, 1 vol. 8vo.

f—Codex Medicamentarius, sive Pharmacopœia Gallica. Paris, 1818, 4to.

*f** designates the additions of Henry.

*f*** designates those of Fee.

fe—Farmacopœia Ferrarense. Padua, 1825, 18mo, 10th edition.

ff—Formulaire Pharmaceutique à l'usage des Hôpitaux Militaires de France. Paris, 1821, 1 vol. 8vo.

fi—Pharmacopœia Fennica. Abo, 1819, 1 vol. 8vo.

fu—Dispensatorium Fuldense. Frankfort on the Main, 1791, 8vo, 3d edition.

g—Pharmacopœia Genevensis. Geneva, 1780, 1 vol. 8vo.

ham—Pharmacopœia Pauperum in usum Instituti Clinici Hamburgensis. Hamburg, 1804, 1 vol. 8vo.

han—Pharmacopœia Hannoverana. Hanover, 1819, 1 vol. 8vo.

he—Dispensatorium Electorale Hassiacum. Marburg, 1806, 1 vol. 8vo.

li—Dispensatorium Lippiacum genio moderno accommodatum. Lemgo, 1792, 94. 2 vols 8vo.

lo—Pharmacopœia Londinensis. London, 1815, 1 vol. 8vo.

o—Pharmacopœia Oldenburgica. Oldenburgh, 1801, 1 vol. 8vo.

p—Pharmacopœia Lusitana. Lisbon, 1711, 1 vol. folio.

pa—Dispensatorium Medico-Pharmaceuticum Palatinatus. Manheim, 1764, 1 vol. folio.

po—Pharmacopœia regni Poloniæ. Warsaw, 1817, 1 vol. 8vo.

pp—Pharmacopœia Castrensis Borussica. Kœnigsburg, 1823, 1 vol. 8vo.

pr—Pharmacopœia Borussica. Berlin, 1813, 1 vol. 8vo.

r—Pharmacopœia Russica. St Petersburg, 1803, 1 vol. 8vo.

s—Pharmacopœia Saxonica. Dresden, 1820, 1 vol. 8vo.

sa—Pharmacopœia Sardoa. Turin, 1773, 4to.

su—Pharmacopœia Suecica. Stockholm, 1817, 1 vol. 4to.

w—Pharmacopœia Wirtembergica. Stutgard, 1798, 1 vol. folio.

wu—Pharmacopœia Herbipolitana. Wurzburg, 1796, 1 vol. 8vo.

ww—Pharmacopœia in usum Noiscomii Militaris Wurceburgensis. Wurzburg, 1815, 1 vol. 4to.

---

a—Ainslie (Whitelaw), Materia Medica, or some account of those articles which are employed by the Hindoos and other eastern nations, in their medicine, arts and agriculture. London, 1826, 2 vols, 8vo.

au—Augustin (Frederick Louis), Pharmacopœia extemporanea, exhibens compositiones medicamentorum, ad observata et principia recentiorum accommodatas. Berlin, 1822, 1 vol. 18mo.

b—Brera (Valerien Louis), Ricettario Clinico. Padua, 1825, 1 vol. 8vo.

be—Bergius (Peter Jonas), Materia Medica e regno vegetabili sistens, simplicia officinalia, pariter atque culinaria. Stockholm, 1782, 2 vols 8vo.

bo—Bories, Formulaire de Montpellier. Montpellier, 1822, 1 vol. 12mo.

br—Burgnatelli (L. V.), Pharmacopée Générale à l'usage des pharmaciens et des médecins modernes, traduite de l'Italien par Planche. Paris, 1811, 2 vols 8vo.

*br** designates the additions of Planche.

c—Coxe (John Redman), The American Dispensatory, containing the natural, chemical, pharmaceutical, and medical history of the different substances employed in medicine. Philadelphia, 1825, 1 vol. 8vo.

ca—Cadet de Gassicourt (C. L.), Formulaire Magistral, et Mémorial Pharmaceutique. Paris, 1823, 1 vol. 18mo, 5th edition, published by V. Bally.

e—Ellis (Benjamin), The Medical Formulary, being a collection of prescriptions derived from the writings and practice of many of the most eminent physicians in America and Europe. Philadelphia, 1826, 1 vol. 8vo.

fp—Dispensaire du Bureau de Charité de Paris. Paris, 1819, 8vo.

g—Guibourt, (N. J. B. G.) Histoire abrégée des Drogues Simples. Paris, 1826, 2 vols 8vo.

hp—Hufeland (C. G.), Armenpharmacopœia. Berlin, 1825, 8vo.

m—Murray (J. A.), et Gmelin (J. F.), Apparatus Medicaminum tam simplicium quam præparatorum et compositorum. Gottingen, 1776—96, 8 vols 8vo.

ma—Magendie (F.), Formulaire pour la préparation et l'emploi de plusieurs Nouveaux Médicamens. Paris, 1827, 12mo.

pa—Paris (J. A.), Pharmacologie. London, 1825. 2 vols 8vo.

pid—Piderit (P. J.), Pharmacia Rationalis. Gerlach, 1806, 1 vol. 8vo.

pie—Pierquin, Memorial Pharmaceutique. Montpellier, 1824, 32mo.

ra—Ratier (F. S.), Formulaire pratique des Hôpitaux Civils de Paris. Paris, 1827, 18mo.

sa—Saunders (William), Pharmacopœia in usum Studiosorum. Leipsic, 1790, 8vo.

sm—Saint-Marie (Etienne), Nouveau Formulaire Médical et Pharmaceutique. Paris and Lyons, 1820, 1 vol. 8vo.

sp—Spielmann (James), Pharmacopœia Generalis. Strasburg, 1783, 1 vol. 4to.

sw—Swediaur (F.), Pharmacopœia Medici Practici Universalis. Brussels, 1817, 3 vols 12mo, 3d edition, by J. B. Van Mons.

*sw** indicates the additions of Van Mons.

sy—Pharmacopœia Syphilitica. Paris, 1799, 12mo, by F. Swediaur.

vm—Van Mons, (J. B.) Pharmacopèe usuelle, thèorique et pratique. Louvain, 1821, 2 vols 8vo.

z—Zarda (A. V.), Pharmaca Vegetabilia juxta Pharmacopœiam Austriaco-provincialem. Prague, 1782, 1 vol. 8vo.

New Organic Alkalies discovered in Cinchona Bark.—We derive the following interesting article from the *Journal des Progres*, Vol. III. for 1829. Dr Serturner, chemist of Hamelm, remarked, during the prevalence of an epidemic intermittent fever in 1828, that the quinia was far from being a certain specific against this disease, even when given in doses of six or eight grains, conjoined with acids. It stopped the paroxysm, but not in a permanent manner; for there were many relapses, which made it necessary to resort to the bark in substance, which, administered in large doses, in conjunction with acids, rendered the relapses much less frequent. Dr Serturner likewise ascertained, what has been

observed by other practitioners, that quinia cannot be substituted for cinchona, as a tonic. He was, therefore, induced to undertake new analytical researches on the different kinds of cinchona bark, with the view of ascertaining the cause of this difference. The details of his experiments he reserves for future publication, communicating at present his principal results, which are as follows:

The precipitates obtained by treating the acidulous extracts of cinchona bark by alkalies, comprise, besides quinia and cinchona, certain additional organic alkalies, which may be considered as modifications of the former.

These new organic alkalies, and especially the principal one, which Dr S. calls chinioidia (*chinioidine*), are intimately united with a sub-acid resinous substance, which, if not hurtful, is at least not beneficial, and which is very difficult to separate. Its separation can be effected completely, only by the vegeto-animal charcoal, which is obtained in the preparation of safranic acid, discovered by M. Liebig. After having dissolved in strong sulphuric acid, (diluted with three or four times its weight of water) the impure alkaline substance, which remains after the sulphate of quinia has been separated by crystallization, the solution is to be decolorized, by means of a mixture of the vegeto-animal charcoal, above-mentioned, with ordinary animal charcoal. But, before conducting this decoloration, it is best to treat the solution with alcohol, in order to separate the earthy salts.

The new alkali exists in the cinchona barks, associated with quinia and cinchona.

Properties of chinioidia. It resembles the other alkalies of the cinchona bark, in its insolubility in water, its colour and taste. But it is distinguished from them by its activity, and its greater capacity of saturation. Its alkaline reaction, and its intimate combination with an extractive matter, which is probably an acid, are characters not less striking. Its salts, when freed from extractive, are affected by heat and liquids, after the manner of balsams; being vis-

cid and fusible like the latter, although they contain frequently, to all appearance, their acids in a dry state. As a medicine, chinioidia is one of the most precious agents of the materia medica. It is not merely a better febrifuge than quinia, and even than the bark in substance; but it possesses many other therapeutic properties, which, admitting that they exist in the bark itself, are not to be found in quinia. It was prescribed by Dr Serturner [in saline combination?] in the dose of two grains, three times a day, with the direction to swallow a little vinegar after each dose, with the view of saturating the gastric juice, which is sometimes alkaline in fevers, and which by acting on the salt, sets free the chinioidia, and thereby renders the medicine inert, in consequence of the insolubility of the new alkali when uncombined. In all the cases, treated by the new remedy, the fever was cut short without relapse, and in every instance, the concomitant symptoms, such as the paleness of face, loss of appetite, œdema of the legs, &c. disappeared in a shorter time than is usually the case. The medicine failed only in a single instance. The quantity necessary to effect a cure was generally from twelve to twenty-four grains.—*N. Am. Med. and Surg. Journal.*

Artificial Preparation of Ice.—After numerous trials made by M. B. Meylink with different salts, for the purpose of converting water contained in a tin vessel into ice during their solution, he ultimately gave the preference to a mixture of four ounces nitrate of ammonia, four ounces subcarbonate of soda, and four ounces of water. This mixture in three hours produced ten ounces of ice; whilst with the mixture of sulphate of soda and muriatic acid, he obtained ice only after seven hours.

Action of Iron on Ammonia.—M. Despretz announced some time since, that when heated metals were subjected to the action of ammoniacal gas, they underwent a considerable

change in their weight, in consequence of combining with some part of the ammonia.

He now states that the weight of iron is sometimes increased as much as 11.5 per cent. in such an experiment, in consequence of the combination of nitrogen with it. If the temperature applied be too high, the nitrogen is expelled, and the compound destroyed.—*La Globe, April* 14.

Adulteration of Chromate of Potash; its detection.—The chromate of potash has the power of combining with other salts of potash up to a certain extent, without any very sensible change in its form and appearance; and hence it has been sent into the market for the dyers, falsified by considerable quantities of sulphate and muriate of potash, the presence of which it has been difficult to ascertain.

M. Zuler has, in consequence, and in consideration of the power of vegetable acids upon it, devised the following process for this purpose :—Add a large excess of tartaric acid to the chromate of potash to be tried; the chromate will be decomposed, and acquire in about ten minutes a deep amethyst colour. It will now, if pure, form no precipitate with nitrate of baryta or silver, by which means the presence of muriate or sulphate of potash may be readily ascertained.—*Bull. de Mulhause.*

Preparation of Hartshorn Jelly.—The following process is due to M. Ferrez : Four ounces of rasped hartshorn are to be steeped in eight ounces of water, acidulated with sixty grains of muriatic acid for ten minutes, and then washed carefully in two or three waters. It is then to be boiled with fresh water for half an hour, pressed through a cloth, and the liquid filtered whilst hot. This fluid is the jelly, which, being qualified by sugar or other ingredients and boiled slightly, gives upon cooling, a perfectly clear and good jelly for the table.—*Jour. de Pharmacie*, 1828.

Gathering of Medicinal Roots.—According to M. Kittel, roots should always be gathered in the autumn. This rule is without exception for all plants not annuals, with this difference, that the roots of biannuals should be gathered in the first year, whilst those of the rest may be gathered any year in their lifetime; but the roots gathered before the flowering year are always more charged with active principles than those which have often supported a stem and flowers, so that roots of the first, second, and third year, are better than older roots. This is especially the case with aromatic and narcotic roots, as arnica, briony, gentian, belladonna, angelica, liquorice, sarsaparilla, dandelion, fennel, &c. The volatile, bitter, aromatic, nauseous, and in general, all active, peculiar principles, are more abundant in the cortical layers of the roots, than in the woody part.

For these reasons M. Kittel says, that fresh roots should never be allowed to be bought and sold for medicinal use, except in the autumn and winter.—*Repertorium der Pharmacie.*

Decomposition of Corrosive Sublimate by Vegetable Bodies.—According to the experiments of M. Fabian, the mucilage of quince seed, (semence de coing), and that of salop, decomposes corrosive sublimate the instant it is mixed with its solution; but the decoction of marshmallow does not produce the same effect, and the extract of liquorice only partially.

INDEX TO VOLUME I.

Abbreviations explained in the Pharmacopée Universelle . . 312
Acids, tests, ... 52
acetic, arsenic, boric, carbonic, chloric, citric, hydrochloric, iodic, malic, nitric, nitromuriatic, nitrous, oxalic, phosphoric, sulphuric, sulphurous, tartaric, ... 53
carbazotic, preparation of, ... 157
hydriodic, preparation of, ... 77
sulphuric, its action on alcohol, and the results, . . 227
Acetate of baryta, ... 54
and superacetate of lead, ... 56
of mercury, ... 73
Address by the president, ... 241
Adulteration of the chromate of potash, its detection, . . . 319
Alcohols and ethers, ... 57
Alcohol acted on by sulphuric acid, ... 227
Alcoholic solution of soap, ... 57
Alkalies, pure, a test, ... 51
new organic in cinchona, ... 316
Alkaline sulphates, ... 54
Allinson, Samuel, Jun. on the protoxide of mercury, and the atomic weight of that metal, ... 81
Allinson, Samuel, Jun. on the non-existence of oxide of mercury in blue pill, 101
Aloes, watery extract of, ... 157
bitter of, ... 157
Ammonia, a test, ... 51
carbonate of, by Daniel B. Smith, ... 161
action of iron on, ... 319
hydrochlorate of, ... 54
Amygdalate soap of soda, ... 236
Antimony, tartarized, comparative activity of different formulæ, . 71
process for, of the French Codex, . . . 288
Henry amended, . . 292
Antimony or arsenic, chloride of, ... 56
Antimoniated tartrate of potassa, ... 287
Aristolochia clematitis, ... 270
longa, ... 271
pistolochia, ... 270
rotunda, ... 271
serpentaria, ... 262

Aristolochia serpentaria, analysis of, ... 267
cum cinchona, ... 270
decoctum, ... 268
extractum, ... 269
infusum, ... 268
tinctura 269
trilobata, ... 271
Arrow root and potato starch, mode of distinguishing, ... 74
Artificial preparation of ice, ... 318
Arts, chlorides employed in, ... 283
Bark, Carthagena, ... 155
Barium, iodide of, ... 202
Baryta, acetate, muriate, nitrate, ... 54
Bicarbonate sodæ, remarks on, by Franklin R. Smith, ... 93
Bladders, evaporation by means of, ... 68
Blue mass, remarks on, by Elias Durand, ... 100
pill, non-existence of oxide of mercury in it, by S. Allinson, Jun. . 101
Borate, sub, of soda, ... 55
Bottles, mode of removing stoppers, ... 46
Calcium, iodide of, ... 203
Caoutchouc, solvent for, and mode of converting into sheets, by J. K. Mitchell, ... 311
Carbazotic acid, ... 157
Carbonate of ammonia, ... 161
potash, soda, ... 54
Carburets, ... 57
Carter's communication on sp. nit. dulc. 305
Carthagena bark, ... 155
Charcoal, decolouring action of, ... 237
Chevallier's, Dr, formula for liquid chloride of lime, ... 278
Chevallier on tartar emetic, ... 287
Chinese materia medica, ... 150
Chinioidine 317
Chlorides in general, and especially those of the oxides of calcium and sodium, by Elias Durand, ... 272
Chlorides of arsenic, antimony, or platina, ... 56
lime, ... 275
preparation of, ... 277
liquid preparation of, ... 278
oxide of sodium, ... 278
soda, Payen's process for, ... 282
soda and potassa—considerations of their utility and employment in the arts, rural and domestic economy, public salubrity, and in therapeutics, ... 282
Chromate of potash, adulteration of, its detection, ... 319
Cinchona with serpentaria, ... 270
new organic alkalies discovered in, ... 316
Citrine ointment, remarks on, by W. R. Fisher, ... 171
Cleanliness and cleaning, ... 40

Codex Medicamentarius, translation of preface of, ... 59
process of, for tartar emetic, . . . 288
College minutes, ... 22, 305
Committee's report on Carter's communication, ... 307
Conium, or active principle of conium maculatum, ... 76
Conwell, Dr, on tobacco, ... 104
Copaiva, solidification of, by Elias Durand, ... 3
new process for extracting volatile oil of, and saponifying the resin, 117
Copper polished, ... 56
Cornus circinata 73
Corrosive sublimate more soluble in alcohol and ether containing camphor, 158
decomposed by vegetable bodies, . . 320
Crystals, spontaneously formed in ol. turpentine and mustard seed, . 309
Cyanogen, perchloride of, ... 232
Cyanic acid, ... 232
Decoction of serpentaria, ... 268
Decolouring action of charcoal, ... 237
Deutochloride of mercury, ... 56
Diamonds, artificial, ... 76
Dublin process for tartar emetic, amended by Henry, . . 292
Durand, Elias, on blue mass, ... 100
on chlorides in general, and especially on those of the oxides of calcium and sodium, ... 272
on copaiva solidified, ... 3
on the difference between minims, drops and grains, and the minim measure, ... 165
on the formation of crystals in oil of turpentine and mustard seed, ... 309
on Mitchell's, J. K. process for dissolving, &c. caoutchouc, 311
Earths, lime and magnesia, tests, ... 52
Economy, rural and domestic, employment of chlorides in, . . 283
Ether, sulphuric, ... 58
Etheris nitrosi dulce, process for, ... 308
Evaporation by means of bladders, ... 68
Extract of aloes, watery, ... 157
sarsaparilla, useless, ... 300
serpentaria, ... 269
Faraday, selections from his Chemical Manipulations, . 39, 119
Fecula, memoir on, by M. Guibourt, ... 208
effects of bruising, ... 209
properties of, ... 210
Ferro-cyanuret of potassium, red, process for, ... 159
Fisher, William R. on the preparations of iodine and their compounds, . 87
on citrine ointment, ... 151
Formulæ for solution of oxide of chloride of calcium; Messuyer, Labarraque, and Chevallier, ... 278
Formulæ for infusion of sarsaparilla, ... 303
Elliott's for sp. nitrosi dulce, ... 308
Galls, tincture of, ... 58
infusion of, test for emetic tartar, ... 295

Gathering of medicinal roots, ... 320
Gauthier or linen plaster, ... 38
Gelatine in solution, ... 58
Geranium maculatum, by E. Staples, M.D. 170
Graduates of the College, names of, ... 80
Guibourt on fecula, ... 208
on the combinations of mercury with oxygen and sulphur, . 214
Hahnemann's soluble mercury, ... 218
probatory liquor, ... 57
Hancock, J. M.D., on the doubtful identity of the bonplandia trifoliata of Humboldt and the Angustura bark tree, ... 26
Hancock's observations on sarsaparilla and its preparations, . . 295
Hartshorn jelly, preparation of, ... 319
Henry's magnesia, ... 72
Henry, Sen.'s amended process for tartar emetic, ... 292
Hydriodic acid, preparation of, ... 77
Hydriodate of potassa, ... 201
Hydrochloric acid, ... 53
Hydrochlorate of ammonia, ... 54
of baryta does not precipitate tartar emetic, . . 295
Hydrocyanic acid, preparation of, ... 235
Hydro-ferro-cyanate of potassa, a test for tartar emetic, . . 295
Hydrosulphates, tests for tartar emetic, ... 295
Ice, artificial, preparation of, ... 318
Infusion of galls for tartar emetic, ... 295
Infusum of serpentariæ, ... 268
acetatum, ... 269
cardiacum or alexiterium, ... 268
Iodides, on the preparation of, ... 200
of barium, ... 202
calcium, ... 203
iron, ... 203
mercury, ... 204
potassium and sulphur, ... 201
Iodine, preparations of, and their compounds, by W. R. Fisher, . . 87
in muriate of soda, ... 154
Saratoga waters, ... 160, 222
Iron, action of, on ammonia, ... 319
iodide of, ... 203
polished, ... 56
Jalap, analysis of, ... 160
Jelly, hartshorn, preparation of, ... 319
Kermes mineral, sophisticated with red saunders, ... 239
Kino, ... 156
Labarraque's, Dr, formula for liquid chloride of lime, . . . 278
disinfecting liquor, ... 278
process for, ... 279
Lead, acetate and superacetate of, ... 56
nitrate of, ... 55
superacetate of, does not disturb tartar emetic, . . . 295

Lime, chloride of, liquid, ... 278
muriate of, ... 54
oxymuriate of, ... 275
sulphate of, ... 54
test, ... 52
Linseed and nitrate of silver, action between, ... 74
Liquor, probatory, of Hahnemann, ... 57
Loan for apparatus, ... 22
Magnesia, a test, ... 52
Henry's 72
sulphate of, and sulphate of zinc, ... 155
Massuyer's, Dr, formula for the liquid chloride of lime, . . . 278
Materia medica of the Chinese, ... 150
Medicinal roots, gathering of, ... 320
Medico Botanical Society, ... 26
Melaleuca leucadendron and M. cajuputi, specific differences between, . 193
Mercury, acetate of, ... 73
combination of, with oxygen and sulphur, by M. Guibourt, . 214
deutochloride of, ... 56
deuto-iodide of, ... 205
iodide and proto-iodide of, ... 204
liquid or flowing, ... 56
nitrate of, ... 55
oxides of, ... 218
black and grey, ... 218
red 219
oxide of, non-existence in blue pill, by Samuel Allinson, Jun. . 81
periodide of, preparation of, ... 75
protonitrate of, after Henry, Sen.'s process, ... 221
protoxide of, observations on, by S. Allinson, Jun. . . . 81
in Swaim's Panacea, detected by professor Hare, . . . 239
Metals or reguli, ... 56
Metallic oxides, ... 57
Minims, drops and grains, and the minim measure, by Elias Durand, . 165
Minutes of the College, ... 22, 305
Mitchell's process for preparing sheet caoutchouc, ... 311
Morphia obtained by fermentation, ... 76, 154
Myrrh, origin of, ... 236
Narcotine, ... 20
Neutral salts, ... 54
Nitrate of baryta, ... 54
lead and mercury, ... 55
potassa, ... 54
silver, ... 55
silver and linseed, action between, ... 74
means of detecting the sophistication of, . . . 221
Nitre, residue of, after red heat, ... 74
Nitric acid, ... 52
Nutgalls, tincture of, ... 58
Officers of the College for 1829, ... 24

Oil of laurel, native, remarks on, by T. Hancock, M.D. . . 135
Oils, table of quantity yielded by different plants, by C. Recluz, of Paris, 132
Oil, volatile, of copaiva, ... 117
Ointment, citrine, ... 171
of hydriodate of potassa, ... 205
of iodide of sulphur, ... 205
Opium and its constituents, by E. Staples, M.D. 12
fermentation of, ... 76, 154
Oxalate of ammonia does not precipitate tartar emetic, ... 295
Oxides of mercury, ... 218
black and grey, ... 218
red, ... 219
prepared without acid, formerly red precipitate per se, 220
metallic, ... 57
Oxymuriate of lime, ... 275
preparation of, ... 277
liquid, ... 278
Parillina, or active principle of sarsaparilla, ... 156
Payen's process for chloride of soda, ... 282
Periodide of mercury, preparation of, ... 75
Pharmacopée Universelle, explanations of the abbreviations used in, . 312
Pharmacy, Commencement of the Philadelphia College of, . . . 240
Spanish, organization of, ... 206
state of, in France, ... 78
Philadelphia 79
Plasters, ... 107
Platina, Wollaston's mode of rendering malleable, ... 74
Potassa, a test, ... 51
carbonate of, ... 54
hydriodate of, ... 201
nitrate of, ... 54
prussiate of, ... 55
Potassium, in residue of nitre, ... 74
red, ferro-cyanuret of, process for, ... 159
Potato starch and arrow root, mode of distinguishing, . . . 74
Preparation of chloride of oxide of calcium, ... 277
President's address, ... 241
Prizes proposed by the Society of Pharmacy of Paris, ... 236
Process for preparation of tartar emetic, of French Codex, . . 288
Dublin, amended by Henry, . 292
Philips, ... 290
Prospectus, ... 1
Quercia, a new substance discovered in the bark of quercus falcata, by Joseph Scattergood, ... 97
Reagents, remarks on, by J. J. Virey, ... 51
Red ferro-cyanuret of potassium, process for, ... 159
Reguli, or metals, ... 56
Residuum of nitre after exposure to red heat, to procure oxygen, . 74
Rhubarb, ... 139
Robiquet's letter to the College, ... 309
Roots, medicinal, gathering, ... 320

Rules for young experimenters, ... 125
Sago, cultivation of, in the East, ... 31
Salts, with alkaline and earthy bases, ... 54
metallic bases, ... 55
Salubrity, public, promoted by the chlorides of lime and potassa, . . 284
Saratoga water, iodine in, ... 160, 222
Sarsaparilla, active principle of, ... 156
observations on, and its preparations, by J. Hancock, M.D. . 295
injured by decoction, ... 299
criterion of good, ... 298
extract of, useless, ... 300
Saunders, red, used to sophisticate kermes mineral, ... 239
Scattergood, Joseph, on quercia, ... 97
Senega polygala, active principle of, ... 156
Serpentaria aristolochia, ... 262
Virginiana, ... 262
cum cinchona, &c. 270
decoction of, ... 268
extract of, ... 269
infusion of, ... 268
tincture of, ... 269
Silver, nitrate of, ... 55
and linseed, ... 74
means of detecting the sophistication of, . . 221
Smith, Daniel B. on carbonate of ammonia, ... 161
address, ... 241
on Virginia snake root and the genus aristolochia, . 262
Soap, alcoholic solution of, ... 57
of soda, amygdalate, ... 236
Soda, bicarbonate of, ... 93
carbonate of, ... 55
chloride of, ... 278
subborate of, ... 55
Solidification of copaiva, by E. Durand, ... 3
Spirit. ætheris nitrosi, process for, ... 309
Carter's remarks on, ... 305
Sponges, prepared, ... 221
with wax, ... 222
without wax, ... 222
Staples, Dr Edward, on opium, ... 12
xanthoxylum fraxinæum, ... 163
geranium maculatum, ... 170
Starch, is it a peculiar vegetable product? 213
Stoppers, methods of removing, ... 46
Strychnia not reddened by nitric acid, ... 75
Sulphuric acid, ... 52
ether, ... 58
Sulphurets, and carburets, ... 57
Sulphates, alkaline, ... 54
of copper and iron, ... 55

Sulphate of quinia, means of ascertaining the purity of, by R. Philips, London, ... 28
Sulphuretted hydrogen, test for tartar emetic, ... 295
Supernitrate of silver, superacetate of lead do not precipitate tartar emetic, 295
Swaim's Panacea, mercury detected in by professor Hare, . . 239
Table of the quantity of volatile oils yielded by different plants, . 132
loss in the pulverization of various drugs, . . . 138
Tartar emetic, by A. Chevallier, ... 287
process of the French Codex 288
Tent sponges, ... 222
Tenant's bleaching powder, ... 275
Tests of Virey, ... 57
for tartar emetic, ... 295
Therapeutics, application to, of the chlorides, . . . 285
Tincture of galls, ... 58
tan, ... 58
serpentaria, ... 269
Tobacco, analytical memoir on, by C. C. Conwell, M.D. . . 104
Translation of the Codex Medicamentarius of Paris, . . . 59
Trustees of the College, ... 309
Turpentine, oil of, and mustard seed, furnish spontaneous crystals, . . 309
Upas antiar and tieuta, ... 113
Vegetable bodies decompose corrosive sublimate, . . . 320
Virey's, J. J., M.D. letter to the College, ... 309
on reagents, ... 51
Volatile oil of copaiva, ... 117
Volatile oils, table of, ... 132
Waters and aqueous solutions, ... 58
Weights, ... 174
Weight, avoirdupois or Roman, ... 177
Cologne, ... 188
division of the medical writers, . . . 180
moneyers, ... 180
traders, ... 179
foil 186
foreign, ... 187
French, ... 188
pile of 190
tower or Saxon, ... 180
troy or Norman, ... 182
Wollaston's method of rendering platina malleable, . . . 70
Xanthoxylum fraxinæum, by Edward Staples, M.D. . . 163
Zinc, sulphate of, and sulphate of magnesia, the resemblance of crystals, 155

END OF VOL. I.

AMERICAN PERIODICAL SERIES

TITLE AMERICAN JOURNAL OF PHARMACY

(4 PRELIMINARY NOS. 1825–1827; VOL. 1, APRIL 1829+)

(NEW SERIES 1–6 AS PHILADELPHIA COLLEGE OF PHARMACY JOURNAL)

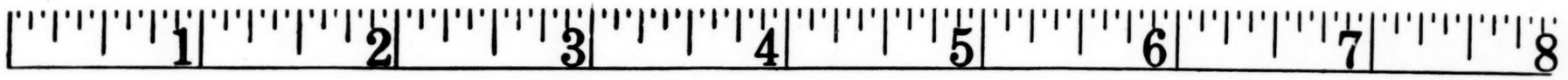
VOLUME 1 – 3 NEW SERIES **NUMBER (S)** _____ **DATE** APRIL 1829 – JAN. 1832

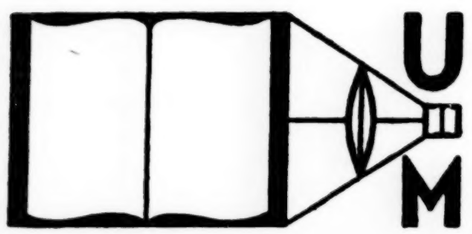
PLACE OF PUBLICATION PHILADELPHIA

PHOTOGRAPHED FROM ORIGINAL IN NEW YORK ACADEMY OF MEDICINE

CONDITION OF ORIGINAL FAIR

ORDER NUMBER APS 730





UNIVERSITY MICROFILMS

ANN ARBOR **MICHIGAN**